

EDIFACT: A GUIDE FOR DECISION MAKING

ELECTRONIC DATA INTERCHANGE ASSOCIATION



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EDIFACT: A STATUS REPORT AND GUIDE TO DECISION MAKING

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1989

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Preface

UN/EDIFACT is an emerging EDI standard intended for worldwide use. The Electronic Data Interchange Association (EDIA) sponsored this study in order to further the association's goal of assisting users and prospective users of EDI. The study was designed to provide information that will assist the EDI user community in determining applicability of EDIFACT to their individual situations, based on a factual foundation. The study was commissioned by EDIA because of an identified need among EDI users that reflected a lack of knowledge about the role of EDIFACT in the overall EDI framework and its future.

The study was conducted by INPUT, a market research firm based in Mountain View, California, which performs research on EDI-related issues and other technologies. Methodology for the study included in-depth review of secondary information on the topic, and interviews with EDI users, government agencies and leading vendors of EDI services and software in North America, Europe and Japan. End user interviews were the key element of data collection. One hundred North American EDI users, screened to confirm their awareness of EDIFACT, were interviewed in depth about their perception of this emerging worldwide standard and related issues. In this sense, the study accurately reflects the beliefs and concerns of vendors, governments, and users contacted who are aware of EDIFACT. Because the interview sample was biased in that direction and was not a scientifically selected random sample, the results do not necessarily provide a basis for conclusions regarding either the business community at large or EDI users as a whole.

The results of this independent study are in no way influenced or biased by EDIA, and the association had no role in the research process apart from originating it and serving in a quality control function.

Having reviewed the study, our conclusion is that the greatest need is for information, education, and training related to EDIFACT and that users expect EDI associations to meet that need. EDIA will be announcing new programs to address this need in the near future.

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Table of Contents

I	Introduction	1
	A. What is EDI?	1
	B. In the Beginning	1
	C. Why Standards?	2
	D. Background of EDI Standards Development	2
	E. Survey Says...	4
<hr/>		
II	Executive Overview	7
	A. Purpose and Sponsorship	7
	B. Methodology	7
	C. Key Findings—Survey Results	10
	D. Key Findings—Analysis	12
	E. Primary Recommendations	12
<hr/>		
III	What is EDIFACT and Why is Everyone Talking About It?	13
	A. International Trade and EDI	13
	1. International Trade Complexity	13
	2. EDI Usage is Growing Internationally	15
	3. Ports Worldwide are Automating	15
	4. Major Transportation Companies Use EDI	15
	5. Government Agencies are Getting Into the Act	15
	6. Trade Associations are Getting Into the Act	17
	7. Banks are Getting Into the Act	17
	8. Services and Software Providers are Involved	17
	B. Introducing UN/EDIFACT	18
	1. Roots of EDIFACT	18
	2. Key Benefits	20
	3. Representing...Whom?	20
	4. Missing Players: The Pacific Rim	20
	5. Not Just for International Trade	21

Table of Contents (Continued)

III	6. EDIFACT Development Process	21
	7. Messages Available	23
	C. Degree of Users' Support for EDIFACT	23
	D. North American EDIFACT Users' Perspectives	37
	1. Sources of EDIFACT Information	38
	2. Awareness Levels	38
	3. Ease of Use Issues	38
	4. Concerns and Impediments	39
IV	Getting Technical About EDIFACT	41
	A. EDIFACT Compared to ANSI X12	41
	1. What is Needed for Standards Convergence	41
	2. Recommended Changes to EDIFACT and ANSI X12	43
	B. EDIFACT Compared to TRADACOMS	44
	C. EDIFACT Costs	47
V	The Role of Networks and Software in EDIFACT	49
	A. Can the Vendors Get Together?	49
	B. Network Services and EDIFACT	50
	1. International Services and EDIFACT	50
	2. On-Network EDIFACT Translation	50
	C. EDIFACT Translation Software	51
	D. North American Vendor Survey	52
	E. Likely Developments in Networks	52
	F. Likely Developments in Software	52
VI	EDI Standards Adoption Outside North America	55
	A. Europe	55
	1. TRADACOMS	56
	2. ODETTE	56
	3. European Research Findings	56
	a. European User Survey	56
	b. European Standards Agency Survey	57
	c. European Vendor Survey	57
	B. Japan	58
	1. Japanese Public EDI Standards: JCA, ZENGIN and EIAJ	59
	2. Japanese Government Agency Involvement	59
	3. Japanese Participation in EDI Standards Development	59

Table of Contents (Continued)

VI	C. Hong Kong	60
	D. Singapore	60
	E. South Korea	61
	F. Australia and New Zealand	61
	G. Summation on International EDI Standards	61

VII	Commentary on Standards Convergence, Evaluating EDIFACT	63
	A. Past EDI Standards Convergence	63
	B. Migration of X12 to EDIFACT	63
	C. The EDIFACT Debate	64
	D. Pros and Cons of EDIFACT	64
	E. EDIFACT User Experiences	67
	F. What's Still Needed?	67
	1. Electronic Negotiable Bill of Lading	67
	2. Monetary Signs are Missing—But Not Needed	68
	3. EDIFACT Requirements of Users	68

VIII	Concluding Remarks	69
	A. Food for Thought for Users	69
	B. Recommendations to Trade Associations	69
	C. Open Issues	70
	D. A Final Thought: To the Nations of the EDI World	71

Appendixes

A	Trade Facilitation Organizations	73
----------	----------------------------------	----

B	EDIFACT Message Development Status Summary	79
----------	--	----

C	EDIFACT, ANSI X12 Syntax Comparison	83
----------	-------------------------------------	----

D	Glossary of EDI-Related Terms	105
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Table of Contents (Continued)

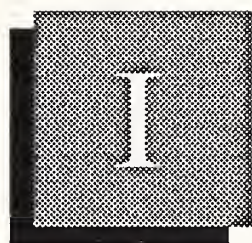
E	EDI-Related Standards Organizations	113
F	Industry Associations Involved in EDI	119
G	International EDI Organizations and Contacts	127
H	EDI-Related Associations and Organizations— Description of Responsibilities and Organization Charts	131
I	References/Bibliography	139
	Questionnaires	
A	EDI User—North America	141
B	EDIFACT User—North America/Europe	151
C	Government Agency—North America/Europe/ Pacific Rim	157
D	Vendor—North America/Europe/Pacific Rim	163

Exhibits

I	-1 Electronic Data Interchange	1
	-2 EDI Standards—A Sea of Acronyms	4
	-3 EDI User Concerns	5
<hr/>		
II	-1 North American User Interview Sample by Distribution Industry	8
	-2 North American Interview Sample Distribution—Respondents	9
	-3 Survey Results—Key Findings	11
<hr/>		
III	-1 Complicated Trade Interfaces	14
	-2 United Nations Organization Structure	19
	-3 Interest in EDIFACT	24
	-4 Importance of Single Global Standard	25
	-5 Effectiveness of EDIFACT Development Procedures	26
	-6 Effectiveness of Representation in EDIFACT Development	27
	-7 Sense of Urgency for EDIFACT Implementation	28
	-8 Why EDIFACT is a Low Priority	29
	-9a Why Companies Are Active in Standards Development	29
	-9b Why Companies Are <u>Not</u> Active in Standards Development	30
	-10 Ability to Identify UN as the Sponsor of EDIFACT	31
	-11 Awareness of Availability of EDIFACT Transactions	32
	-12 Understanding of EDIFACT	33
	-13 EDIFACT Information Sources	34
	-14 Preferred Sources of EDIFACT Information	35
	-15 EDIFACT Concerns	36
	-16 EDIFACT Impediments	37
<hr/>		
IV	-1 EDIFACT, ANSI X12—Comparison of Syntax Differences	43
	-2 EDIFACT, TRADACOMS—Comparison of Syntax Differences	45

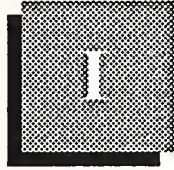
Exhibits (Continued)

V	-1 Network-Based Translation	51
VII	-1 Different Perspectives on EDIFACT	66
VII	-1 Help Needed in Understanding EDIFACT	70
	-2 When Users Expect EDIFACT Will Be Ready to Meet Their Needs	71



Introduction





Introduction

A

What Is EDI?

Electronic Data Interchange (EDI) is the interorganizational, computer application to computer application, electronic interchange of structured business data (Exhibit I-1). It is process-to-process communications in machine-readable formats and overcomes differences between computer systems, their communications protocols, and their internal data formats. EDI is typically applied to transactions such as purchase orders and invoices.

EXHIBIT I-1

ELECTRONIC DATA INTERCHANGE

The Application-to-Application Exchange
of Intercompany Business Data
in Standard Formats

B

In the Beginning

Prior to the adoption of EDI techniques, companies would exchange information using traditional methods: on paper, or by telephone. Facsimile has become increasingly used as a faster method of getting information from one company to another. These techniques have inherent problems: they are error prone, and the data is not directly usable by the trading partner's computer.

In the beginning of the EDI age, data created on one trading partner's computer was transferred to another trading partner's computer by agreeing on the data formats to be used, and physically shipping punch cards,

paper tape, a computer magnetic tape, or diskettes for uploading on the second computer.

Later, as data communications techniques were applied, agreements were made, not only about data formats, but about communications protocols, speeds and the schedule for transmissions. Often the formats used were developed by one company and required of its dependent suppliers.

C

Why Standards?

Over the past decade, the EDI community has developed, adopted, and implemented several families of public and de facto standards that govern the formats used for the electronic interchange of structured business data. These standards define electronic documents and replace paper ones.

The creation of public or de facto formats ensures that more trading partners can participate. Instead of using separate formats for each of its major customers, a supplier can ideally adopt a single format for all customers.

EDI standards now exist in public, proprietary and industry-specific implementations. Public implementations include ANSI X12 for general business documents. An example of an industry-specific standard is the grocery industry's UCS standard. An example of a company-specific standard is Sears' SENDEN system for supplier communications.

Standards have evolved to where specific needs that would have previously called for proprietary development are now being met by the application of public standards.

EDI standards are vehicles for defining the format and content of inter-company data streams. They may also define the communications method used, but a distinction needs to be made between the two. A communications format can be compared to the traditional way of addressing an envelope: The stamp goes in the upper right corner, the return address on the upper left, and the address where we're accustomed to seeing it. A data format describes how the various elements used on (for example) a purchase order, are identified: how are the "units ordered" shown, and what designates the "ship to" address? These elements may not follow strict physical location rules, but rather follow identifier rules, codes which indicate what each element or field describes.

D

Background of EDI Standards Development

Many industry groups have developed their own systems for the electronic interchange of business documents. Among these are air transport, automotive aftermarket, book selling, hardware, health, insurance, iron and steel, petroleum, warehousing and wholesale drugs. While industry-

specific EDI formats have been developed, more recently, a cross-industry approach is being taken, with nuances and adaptations made for industry-specific requirements.

In 1979 the American National Standards Institute chartered the EDI standards group called ANSI X12. ANSI X12-compatible implementation guidelines are being developed and maintained for a wide range of industries such as agriculture, apparel, chemicals, electrical supply, electronics, health care, metals and many others. All these share a common basis—a common data dictionary and data element dictionary, and a common structure.

Two other major North American EDI standards families are:

- UCS (Uniform Communications Standard)—A series of formats developed and maintained by the grocery industry.
- TDCC (Transportation Data Coordinating Council)—A series of formats for transportation related use (Manifests, Waybills, etc.).

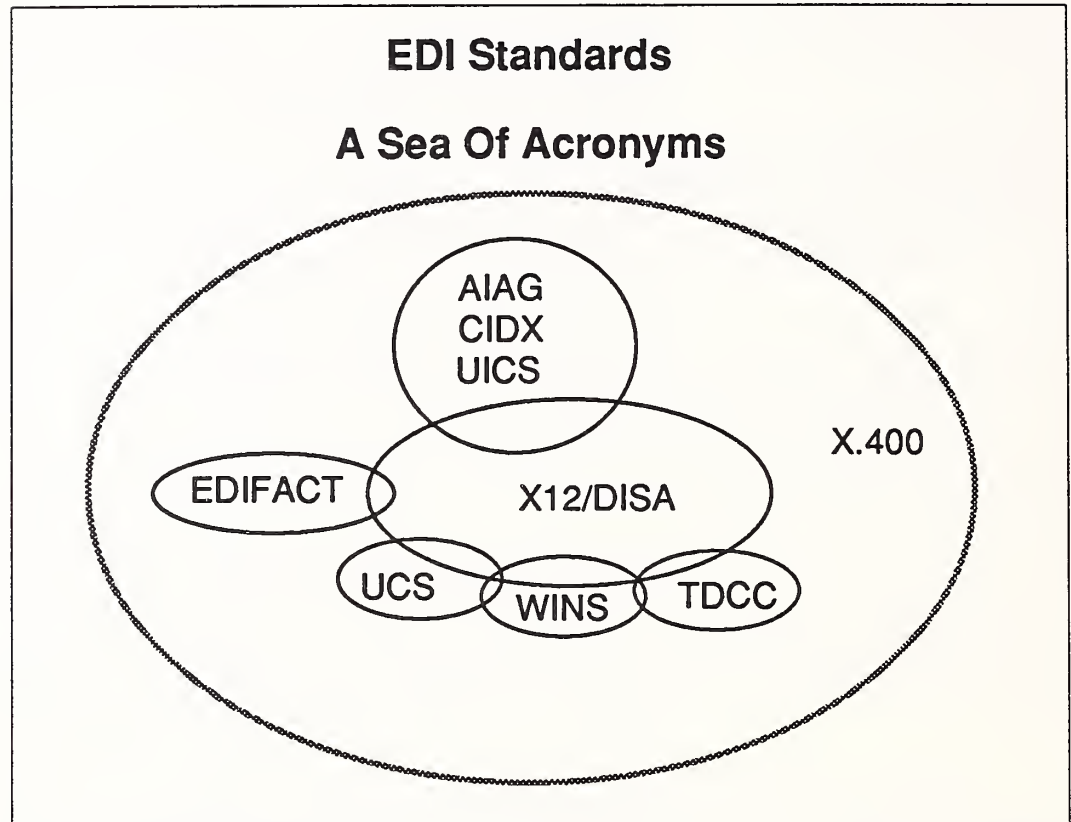
There are EDI standards in other parts of the world, principally in Europe and Japan, as discussed in Chapter VI. Positioned to potentially supersede disparate regional and industry-specific EDI standards, or at the very least to be used in international trade, is a format called United Nations EDIFACT. EDIFACT is an acronym which stands for EDI for Administration, Commerce and Transport. UN/EDIFACT (called EDIFACT in the rest of the report for simplicity) is the focus of this study.

In North America, there appears to be a gravitation from industry-specific and private company formats, toward compliance with the ANSI X12 structures. This is an evolutionary process which is affected by a variety of factors; technical, business and even fraternal. Each of the EDI standards has its own “culture” and personalities which cannot be ignored in examining the standards relationships.

These factors can also be applied to examining global EDI standards developments.

As illustrated in Exhibit I-2, the EDI standards situation is a confusing picture to the uninitiated. The sea of acronyms and overlapping organizations in EDI standards can cause confusion to the EDI novice.

EXHIBIT I-2

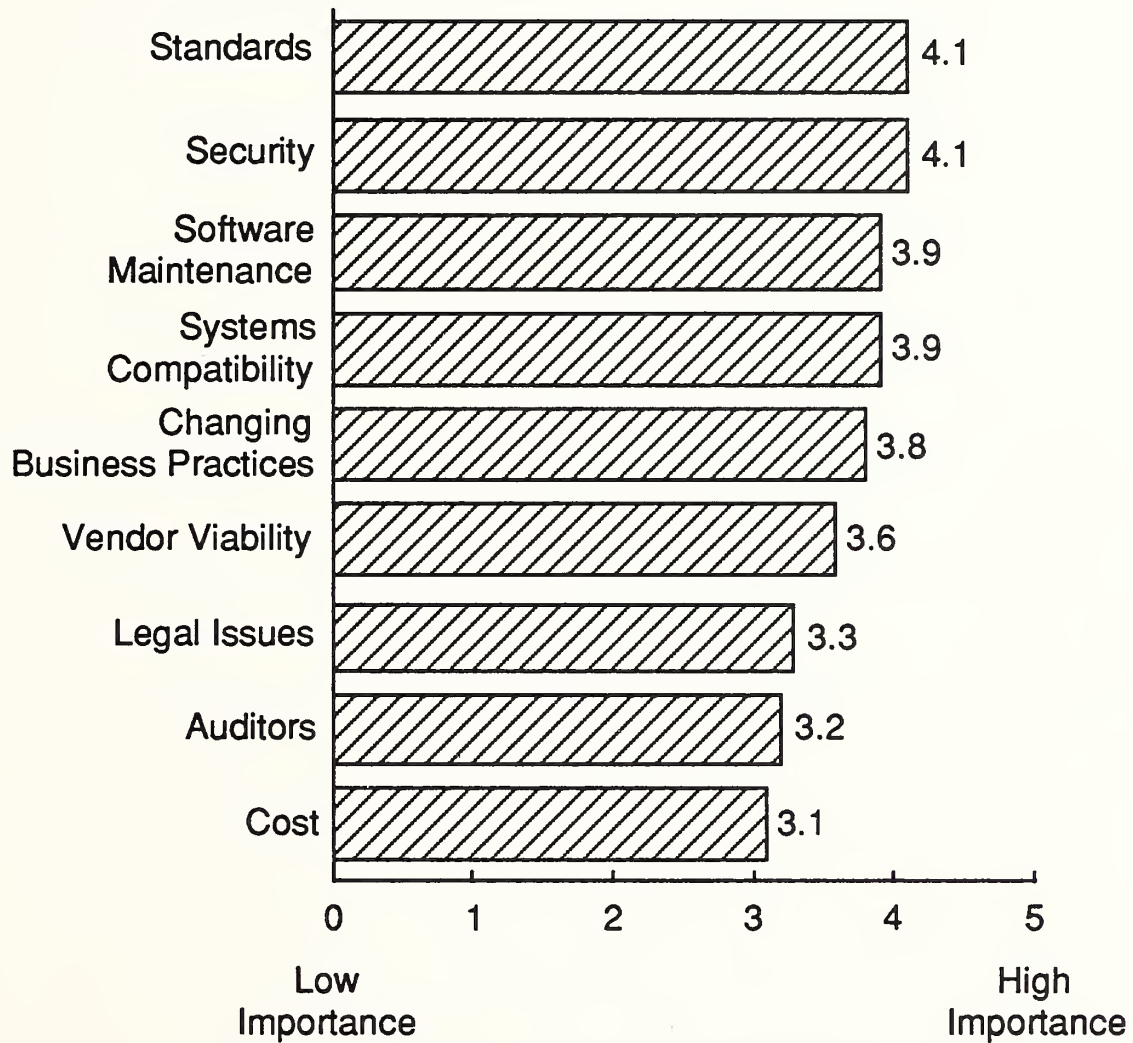
**E****Survey Says...**

The adoption of EDI involves several issues including standards, control and financial responsibilities, business practices, cost issues and security. These concerns can influence market acceptance and implementation success. However, as Exhibit I-3 shows, EDI standards is the number one issue concerning users.

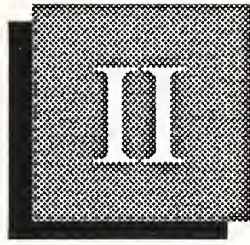
Users are aware of the pressure on proprietary and industry-specific formats development to conform to public standards. But more importantly, many users appear uncertain about a plan of ANSI X12 to migrate or converge with the international EDIFACT standards. There is also uncertainty about the roles of various EDI standards-making organizations.

Users are often dealing with partial information about EDIFACT, and EDI standards in general, a problem which this study addresses. The perceived unsettled status of EDI standards is inhibiting some users from fully implementing EDI. Users are concerned that any investment they make in software, equipment, technical understanding and in some ways, a psychological commitment to the culture surrounding a standard, will not have been in vain *if* the chosen standard proves to be a temporary one, or needs to be changed because of business requirements.

EXHIBIT I-3

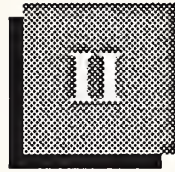
EDI User Concerns*

*Note: These results are from an INPUT survey performed in early 1989.



Executive Overview





Executive Overview

A

Purpose and Sponsorship

This report was prepared by INPUT, a management consulting and market research firm, under contract to the Electronic Data Interchange Association. Its purpose is to assist users and prospective users of EDI by independently analyzing the potential impact of EDIFACT, an emerging EDI standard intended for worldwide use.

B

Methodology

The research for this report consisted of a combination of primary and secondary research.

The primary research consisted of 143 telephone interviews. The major component was 100 North American EDI managers who were questioned specifically about their needs, attitudes, understandings and expectations regarding EDI standards in general and EDIFACT in particular. The companies in this sample were chosen from INPUT's EDI user data base and the EDI Yellow Pages. Excluded from the results reported here were users who had no, or extremely limited, awareness of EDIFACT. Exhibits II-1 and II-2 show the sample distribution for this survey.

EXHIBIT II-1

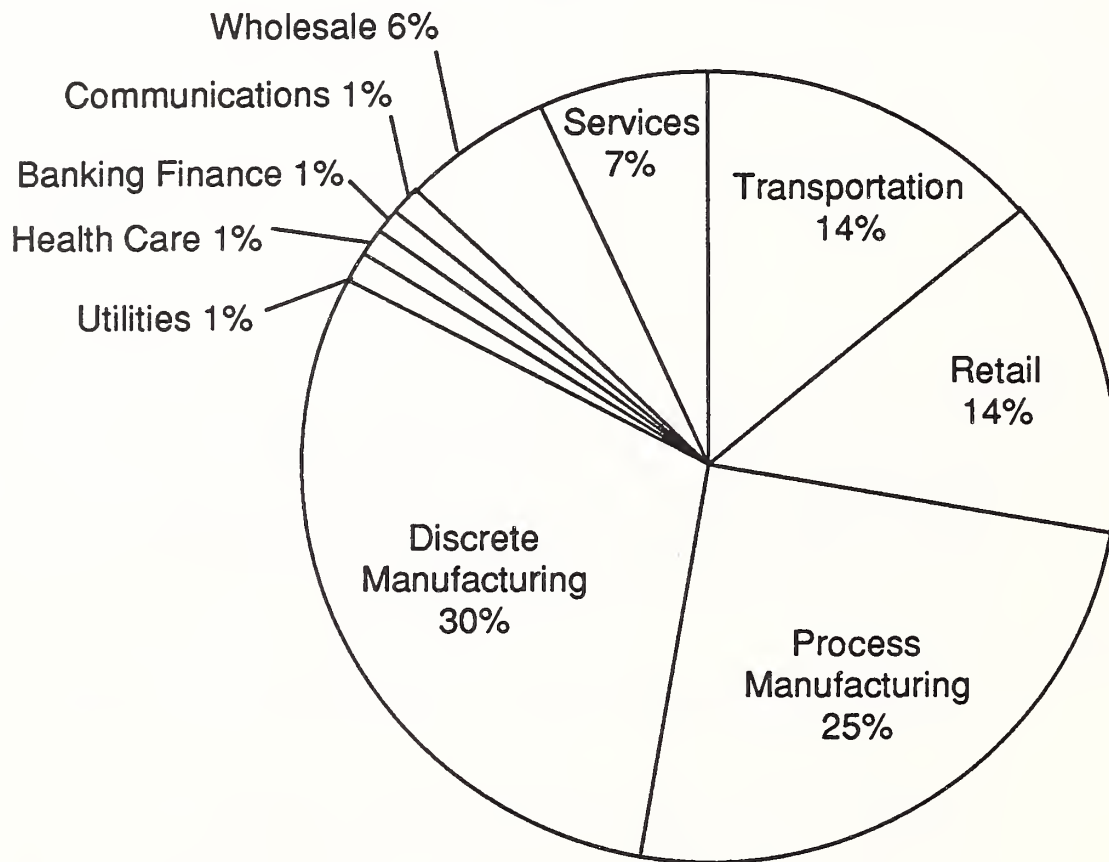
**North American User Interview Sample by
Distribution Industry**

EXHIBIT II-2

North American User Interview Sample Distribution**Respondents**

	IS Managers	IS Executives	EDI Project Managers	EDI Executives	Other	Total
Process Manufacturing	7	6	6	8	3	30
Discrete Manufacturing	9	5	4	2	5	25
Retail	6	4	3	1		14
Transportation	5	4	3	2		14
Services	4			2	1	7
Wholesale	2	1	1	2		6
Banking/Finance		1				1
Communications		1				1
Health Care		1				1
Utilities		1				1
Total	33	24	17	17	9	100

Ten interviews were conducted with government agency representatives in North America, Japan and Europe to gather information regarding responsibilities for creating, supporting, promoting and/or endorsing EDI standards.

Twenty-five interviews were conducted with senior level management of VANs, RCS firms, software providers and professional service firms involved in EDI regarding availability of products and services supporting the EDIFACT standard, and to gather vendor perceptions of user needs. These interviews were also conducted in Europe, Japan and North America.

INPUT collected and analyzed information on EDI services and products with particular attention to those supporting EDIFACT. Ten interviews were conducted with EDIFACT users, evenly split between North America and Europe.

Secondary information consisting of worldwide EDI newsletters, press reports, standards groups' meeting minutes and journal articles was reviewed.

The appendixes to this report contain greater detail on the interview findings, the questionnaires used in the primary research, and the tabulated survey results which are not otherwise reported in the body of the report. Also in the appendixes is a glossary of EDI-related terms.

C

Key Findings— Survey Results

Most users believe in the importance of a single, global EDI standard, and believe that due to good will and global business needs, the necessary compromises can be worked out to create such a standard.

Nearly one-third of active EDI users have no, or very limited knowledge of EDIFACT.

Only 40 percent of respondents interviewed could identify the United Nations as the sponsor of the EDIFACT standard.

North American users generally do not give adoption of EDIFACT a high priority, primarily because their major trading partners are not requiring EDIFACT.

EDI-active companies involved in international trade are not yet using EDI to any extent to support international trade documentation.

In general, users have little understanding about EDIFACT. Most information comes from EDI associations, trade publications and industry-specific associations, in that order. However, users prefer EDI associations as the source of their EDIFACT information.

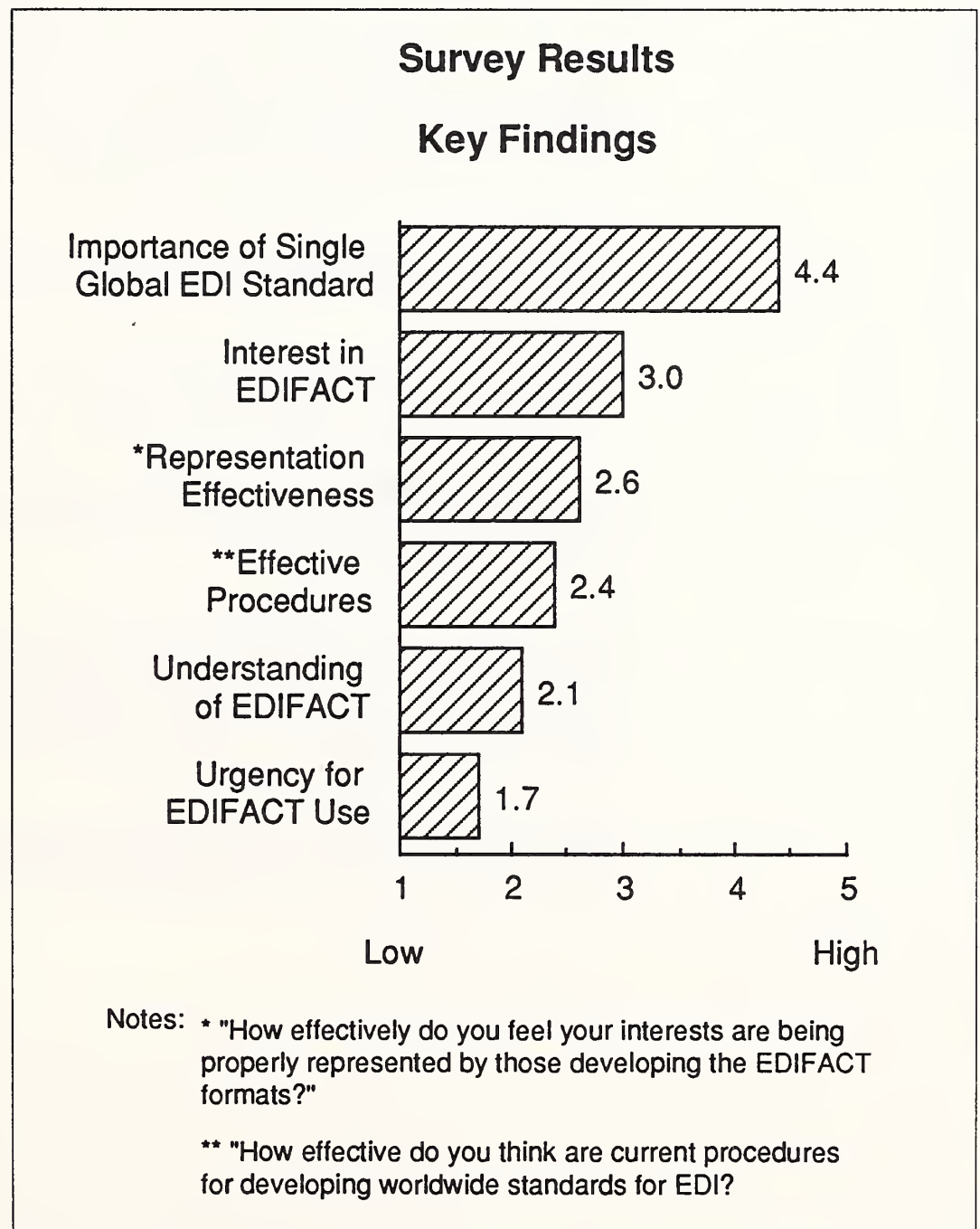
The leading concern about EDIFACT is the possible need for dual systems, primarily from an operational and management perspective. Cost is not a high concern.

The primary impediment to adopting EDIFACT, according to users, is the lack of messages. Other impediments are the perceived lack of EDIFACT software and low levels of technical understanding.

The North American EDI user view is not negatively affected by the perception that EDIFACT is a European invention.

Exhibit II-3 summarizes these key survey findings.

EXHIBIT II-3



D**Key Findings—
Analysis**

The wide variety of standards organizations and different procedures used by the organizations for standards creation and maintenance is confusing users.

While EDIFACT is being driven primarily by the movement toward a unified Europe, it seems inevitable that a universal EDI standard will be adopted. In the meantime, users involved in international trade can plan on supporting at least two standards: the one primarily used domestically (typically ANSI X12) and one for international trade (EDIFACT).

EDI software and service providers can be expected to address user needs for EDIFACT support.

E**Primary
Recommendations**

The “standards controversy” should not be used as an excuse to delay EDI implementation. Standards will continue to evolve. A key issue is the need to get beyond the standards debate to recognize EDI as a productivity tool, and implement it accordingly.

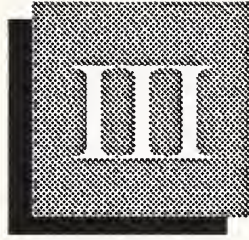
In addition to continuing education and training activities, industry associations should work to raise the level of EDI awareness in corporate management.

Vendors should consider a unified approach to EDIFACT implementation and support in products and services.

Government agencies should remain cautious in endorsing standards, but should work to create a politically influential “champion” for EDI as a national productivity priority.

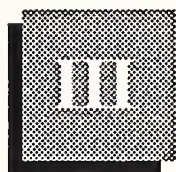
North American users involved in international trade should plan to support EDIFACT in addition to formats used primarily for domestic EDI relationships. The movement to one standard for both types of trade will follow the integration of information systems used to support domestic and international functions.

Users should participate in the standards creation as much as their resources permit, to gain understanding, and to influence the standards.



What is EDIFACT and Why is Everyone Talking About It?





What Is EDIFACT and Why Is Everyone Talking About It?

This chapter first discusses international trade issues before examining the organizational and political specifics of EDIFACT. The next chapter examines EDIFACT from a technical perspective.

A

International Trade and EDI

This section discusses the complexity of international trade and the roles of different organizations including ports, transportation companies, government agencies and banks.

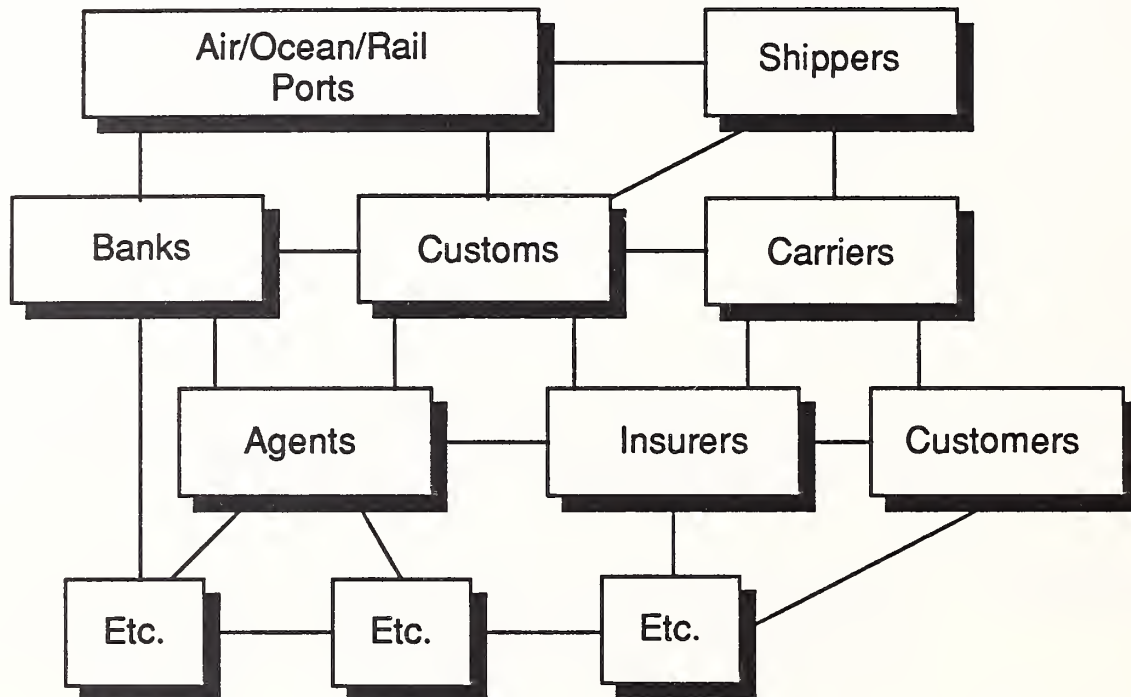
1. International Trade Complexity

The general reasons for using EDI (domestically and internationally) include the time value of information, cost avoidance, better inventory control and benefits realized through the integration of EDI data and corporate information processing.

There are even more compelling reasons to use EDI internationally due to complex trade document requirements and complicated relationships. In addition to the principal trading partners are transportation carriers, freight forwarders, brokers, banks, insurers, customs and other government agencies, as illustrated by Exhibit III-1. These multiple parties often reuse some of the data originally entered by another participant in a trading transaction, or add data to the record.

EXHIBIT III-1

Complicated Trade Interfaces



The costs of managing and controlling the paperwork associated with these multiple interfaces inhibit profitability and slows the process of international trade. The cost of international documentation to U.S. shippers has been estimated at \$8 billion annually, and \$40 billion annually worldwide, representing some 7 billion original trade documents plus copies each year. Estimates vary, but for a single shipment of goods, as many as 28 different organizations may be involved with over 40 documents between them: bills of lading, letters of credit from banks to exporters, manifests, etc. Imagine one shipment of goods arriving by ocean freighter followed by another carrying the paperwork covering the first shipment. The total cost in paperwork for each consignment has been estimated as between \$300-\$400; others have found that paperwork accounts for 8% of the total cost of an international transaction.

Errors are also a factor. Approximately half of all issued letters of credit contain clerical errors. Errors in other trade documentation can delay a shipment, adding storage costs, and adversely influence the downstream manufacturing, distribution and sales chains.

Complicated international trade procedures and policies are ripe for operational improvements to reduce costs while meeting the information needs of all concerned parties. Electronic distribution speeds document

processing, an important factor in an age when a shipment may arrive prior to its paperwork due to high-speed transportation.

2. EDI Usage is Growing Internationally

EDI in international trade will continue to grow substantially. Implied in this statement is the availability of EDI standards across borders and in the various functions that support international trade.

There are EDI activities underway in most parts of the world. As with the U.S., European countries are using EDI in support of domestic trade. Pan-European trade is becoming more important as the 1992 creation of a unified Europe looms closer. This event is one of the primary drivers behind the creation of an international EDI standard. In other areas of the world (e.g. the Pacific Rim), EDI is being implemented primarily for international trade.

3. Ports Worldwide Are Automating

Port automation systems incorporate automated cargo clearance systems that use electronically submitted data. Examples include the Port of New York and New Jersey ACES system, the Miami International Cargo System (MICS), the Port of Baltimore's ACROSS and the Port of Antwerp's Systems Electronic and Adapted Data Interchange (SEAGHA). There are many others around the world.

The development of EDI in Hong Kong and Singapore is specifically for the support of the international trading communities within these territories.

4. Major Transportation Companies Use EDI

International carriers are implementing EDI to provide customers with shipping information, replacing paper correspondence and telephone customer service. American President Companies provides EDI information to its major customers including a Japanese automaker, allowing the manufacturer to manage "just-in-time" auto assembly at its U.S. plants.

5. Government Agencies Are Getting Into the Act

The U.S. Customs Agency has installed automated systems to speed cargo clearances and to handle other functions. The agency is adding support for EDIFACT formats (in addition to its proprietary formats) for entry summary and invoice data submissions by shippers and their agents. U.S. Customs and the Norwegian Directorate of Customs and Excise have agreed to use EDIFACT to exchange trade data between

them; other such agreements are likely to follow. The agency has actively participated in creating several messages being proposed as EDIFACT formats.

The Customs Cooperation Council (CCC), an international body with representatives from several hundred nations, is recommending EDIFACT for trade documentation.

The CCC recommendation, and the support of EDIFACT by the U.S. Customs Agency are some of the more significant reasons for users to adopt EDIFACT. While U.S. Customs has other formats in the various modules of its Automated Commercial System, in order to gain maximum benefit from installed automated systems at ports and customs agencies worldwide, shippers and the agents serving them must adopt the common standards being supported, i.e. EDIFACT.

The U.S. Office of Management and Budget, which is promoting adoption of EDI in various government agencies, has endorsed the use of EDIFACT for international use, while giving government agencies permission to use other formats as the business environment requires.

The Comité Européen de Normalisation (CEN) or European Committee for Standardization has endorsed EDIFACT for international electronic trade within Western Europe. All 18 national standards bodies within Western Europe are members of CEN. This endorsement has the force of requiring all public agency electronic purchasing trade documents to be in the EDIFACT format.

Five North American government agencies were surveyed for this report. Four agencies were active in government, as well as commercial standards development. These agencies saw the benefits of moving data in electronic, rather than paper form, and the importance of standards to enable the increased use of electronic formats.

Agency respondents expressed moderate to high interest in EDIFACT. Their understanding of the standard ranged from poor to high. They felt that their agencies' interests were well represented in EDIFACT development. Respondents obtained information on EDIFACT from EDI associations, industry associations, trade publications and EDI newsletters in that order. The preferred source of EDIFACT information was EDI associations.

To better understand and implement EDIFACT, the agencies expressed a need for technical and consulting assistance, a government-wide policy on standards use, and implementation assistance. They felt that industry groups and cooperative efforts between industry and government bodies should provide guidance.

6. Trade Associations are Getting into the Act

Many nations have trade facilitation bodies formed by major shippers, trade service organizations and government agencies.

Although lacking a formal voice in EDI standards matters, these organizations do have influence and serve as an important conduit for information.

Appendix A lists trade facilitation councils around the world.

The U.S.-based NCITD—International Trade Facilitation Council is a membership organization dedicated to simplifying international trade paperwork by 50%, in part through the use of electronic communications. It, along with its affiliates around the world, are active in spreading information about EDI in general, and EDIFACT in particular.

The General Agreement of Tariffs and Trade (GATT), a multi-nation body that promulgates general guidelines for trade among members, may require governments to explicitly recognize EDIFACT as the EDI standard for domestic use. One of GATT's rules requires signatories to use international standards as the basis of domestic regulation. Domestic technical regulations and standards are not to be used to create obstacles to international trade. Also, GATT members are expected to take full part in the preparation of international standards. Currently, this mandate does not apply to EDI standards because value added network services and telecommunications in general are classified as services and, as such, do not come under the GATT auspices. This is changing. The U.S. government and other advanced industrial nations are negotiating to include services under the GATT umbrella. If this should happen, it is possible that only EDIFACT EDI will get the imprimatur of GATT.

7. Banks Are Getting Into the Act

Several banks, through their Export Trading Company subsidiaries, have introduced EDI services such as Electronic Letters of Credit and Bills of Lading to facilitate international trade. EDI/EFT services are also being applied in this area.

8. Services and Software Providers are Involved

The major EDI third-party networks are now providing, or planning, international EDI services through a variety of agents, alliances, technology licenses and through their own facilities. EDI software providers are building into their products support for international EDI standards. Some EDI translation software firms are adding EDIFACT translation capabilities. More information on the role of vendors is provided in Chapter V.

It is against this backdrop that EDIFACT as a standard designed initially for international trade, but ultimately for all trade—domestic and international—has been introduced.

B

Introducing UN/EDIFACT

Although discussions and organizational efforts began in 1985, the EDIFACT Steering Committee and working groups became active in January 1988, when the United Nations formally chartered UN/EDIFACT to develop International EDI standards.

EDIFACT standards take the form of United Nations Standard Messages (UNSMs), which are analogous to the terminology used by ANSI X12 which calls electronic documents Transaction Sets. The first EDIFACT UNSM, the International Invoice, was approved in 1988 and the second UNSM, Purchase Order, was introduced as a draft currently in trial use.

The EDIFACT syntax or technical grammatical language is based on the International Standards Organization's ISO 9735, which was approved on one of the fastest schedules ever experienced for an international standard. Another standard, ISO 7372, contains the Trade Data Element Directory which identifies the codes used by EDIFACT messages.

Additional technical details about EDIFACT are covered in the next chapter.

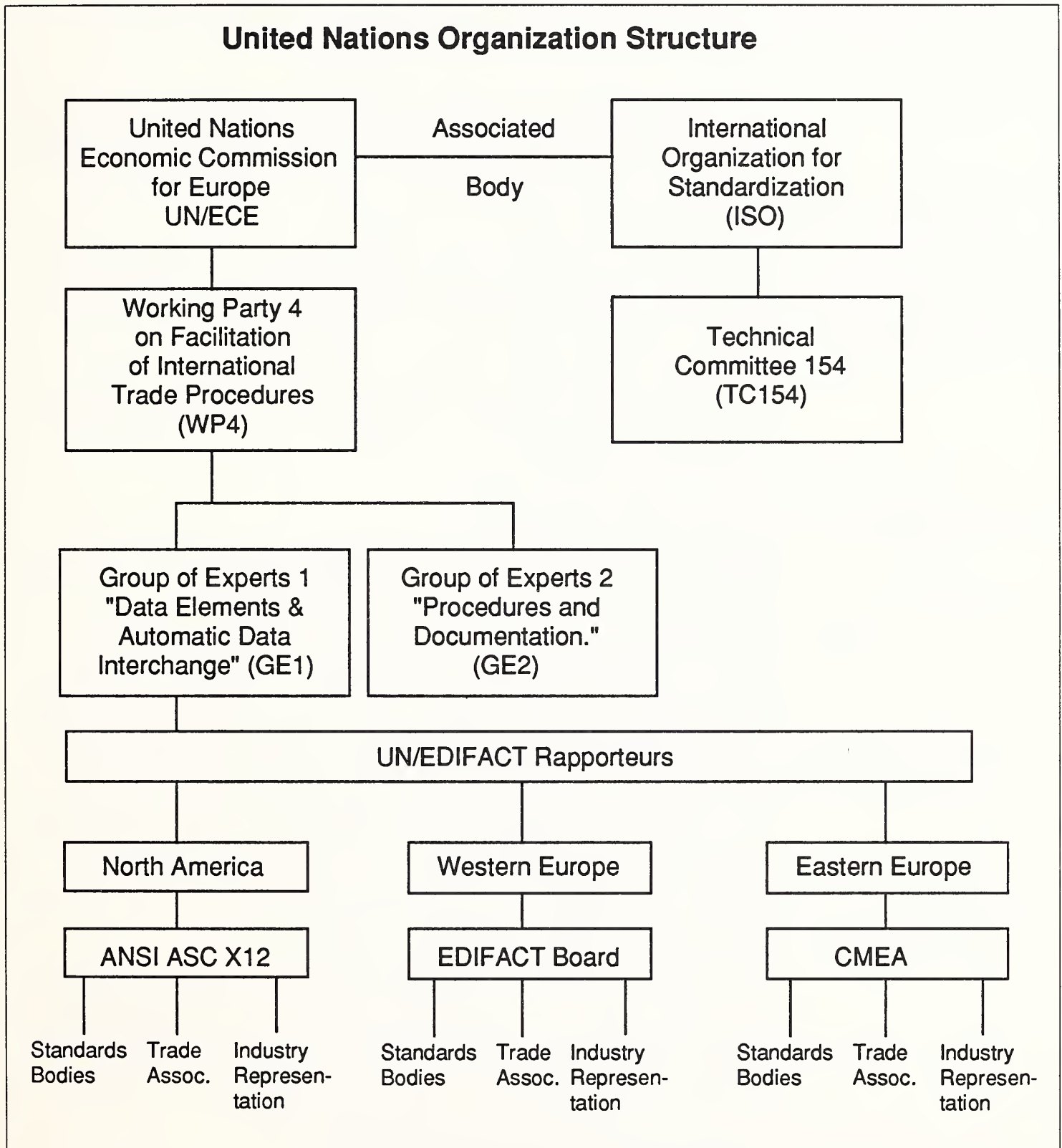
1. Roots of EDIFACT

EDIFACT traces its roots to an initiative by the United Nations' Economic Commission for Europe (UN/ECE) to merge the Europe-developed Guidelines for Trade Documentation Interchange (UN/ECE GTDI) and ANSI X12. Early writings on EDIFACT refer to it as ECE/EDIFACT. The acronym EDIFACT was subsequently coined in 1986 by the UN/ECE. The first Rapporteurs (people responsible for coordinating technical activities) for North America, Western Europe, and Eastern Europe were appointed in 1987.

Exhibit III-2 shows the United Nations structure, and the place of the UN/EDIFACT activity. Note: For simplicity in an otherwise confusing cast of characters, this report will use the term "EDIFACT organization" to refer to the UN/ECE Working Party 4 which is the body developing and maintaining the standard with representation from around the world. Also, the term "EDIFACT" rather than "UN/EDIFACT" will be used.

Although EDIFACT is intended as a merger of the North American- and European-based standards, many feel it is closer to its European roots. Others maintain that EDIFACT is an international compromise. The truth appears to be closer to the latter.

EXHIBIT III-2

United Nations Organization Structure

Because the United Nations and its constituent bodies such as EDIFACT are treaty organizations, the United States is formally represented by the U.S. Department of Transportation (DoT), which has stated that "ANSI X12 will contribute to the development and maintenance of UN/ED-

IFACT standards for the United States.”DoT also stated its “support for continued development and maintenance of ASC-X12 standards.”

2. Key Benefits

The primary benefits of a universal EDI standard are found in the simplicity it offers in arranging trading relationships. If EDIFACT is universally adopted, companies will no longer need to support multiple formats.

Another, more immediate benefit will be the increased use of EDI with trading partners in Europe since companies there expect to adopt EDIFACT for pan-European trade after the 1992 economic unification of Europe.

Also, users of EDIFACT will be able to file various Customs transactions without needing software supporting the unique transactions Customs agencies require.

3. Representing...Whom?

Because it is sponsored by the United Nations, the EDIFACT standard is intended to be in the best interests of all UN members.

ANSI X12 contains the North American EDIFACT Board (NAEB) which is a task group created to coordinate and consolidate U.S. and Canadian involvement in EDIFACT. X12 supports the North American Rapporteur, the expert assigned responsibility for coordinating technical EDIFACT standards development and maintenance in North America. The Rapporteur works with technical experts in North America and in other countries. The first North American Rapporteur was a transportation expert, Dennis McGinnis, from the U.S. division of a multinational company, North American Phillips. The current Rapporteur, Nicole Willenz is also a transportation expert, but associated with the consulting arm of the “Big Eight” accounting firm, Price Waterhouse.

Ray Walker, the Rapporteur representing Western Europe, is currently the Chairman of the U.K.’s Simplification of Trade Procedures Board (SITPRO), which was centrally responsible for creating EDIFACT. The Eastern European Rapporteur, Eugeniusz Danikiewicz, represents the countries of the Council for Mutual Economic Assistance. He is an official of the Foreign Trade Data Center in Poland.

4. Missing Players: The Pacific Rim

Notably missing from formal EDIFACT deliberations are representatives from the Pacific Rim, although observers have attended. EDIFACT delegations have worked to recruit formal participation.

It is likely that two regional Rapporteurs for the South and North Pacific regions will be named by their respective governmental organizations. Australia and New Zealand intend to nominate their representative at the March 1990 meeting of the EDIFACT organization on the Facilitation of International Trade Protection.

5. Not Just for International Trade

Although EDIFACT is primarily being discussed in an international trade context, the standard is being adopted for domestic trade within Italy where EDI standards did not previously exist, and where few companies have EDI experience. The Italian EDI network service company Televas is promoting EDIFACT for domestic trade, while supporting the major U.K. standard called TRADACOMS for trade with British companies. Further, EDIFACT is intended to be a universal standard, usable (but not required) for all EDI trade relationships.

6. EDIFACT Development Process

EDIFACT message development, maintenance and technical assessment in North America are handled through the ANSI X12 organization and its Secretariat, the Data Interchange Standards Association (DISA).

The following summarizes the general procedures related to EDIFACT development and maintenance followed in North America.

- All initial requests are submitted on specific EDIFACT forms.
- The Secretariat (DISA) checks for accuracy and completeness, assigns control numbers and distributes the request to other Rapporteurs and the North American EDIFACT Board (NAEB) officers and the Technical Advisory Working Group.
- The NAEB Technical Advisory Work Group reviews the request at its meetings, providing comments and recommendations to both the X12 Technical Assessment Subcommittee (TAS), and to the Canadian Joint Technical Committee on EDI (JTC/EDI).
- The X12 TAS conducts an initial review and assigns the request to an X12 Subcommittee for Project Proposal recommendations.
- The request is assigned to a subcommittee for development, and then follows X12 procedures through the Subcommittees, TAS and the Procedures Review Board (PRB). TAS and PRB reviews are required for changes in development status prior to being reported to the United Nations.

- Each development subcommittee involved designates a Delegate Liaison representative to the NAEB. A counterpart to this liaison also exists on the Canadian JTC/EDI. The NAEB appoints liaison delegates to X12 TAS and the PRB. These liaisons shepherd the EDIFACT request through the NAEB/X12/JTC-EDI processes, and represent the consensus positions of their appointed subcommittees.
- Each worldwide EDIFACT Board (there's one each for North America, Eastern Europe and Western Europe) has a development structure. Development subcommittees for specific actions are formed for each region, and they must coordinate their overall development efforts prior to submitting the document to the UN.
- At the UN, various levels of status approval are given. These are:
 - Status 0: Working Paper
 - Status P: Draft Proposal
 - Status 1: Draft for Trial Use. Typically, the UNSMs are tested for a one-year period.
 - Status 2: Recommendation as an Approved United Nations Standard Message.
- Finally, the EDIFACT documents are sent out for ballot to members of all national EDI standards organizations under the EDIFACT boards. then they are sent for recommendation to the UN, through the Rapporteur, and prior to a recommendation for Status 2 level assignment.

In general, EDIFACT documents processed in the U.S. must adhere to X12 requirements as well as the special procedures established for North America by the NAEB. These procedures are being meshed with those established by the EDIFACT organization which is the actual body developing the EDIFACT standards.

These steps appear complicated and lengthy, but due to the nature of international standards making, where consensus and multiple inputs are required, they are necessary to ensure fair and equitable participation in the process.

Documentation describing EDIFACT standards is available through national EDI standards organizations. In the U.S. it can be obtained through DISA.

7. Messages Available

As can be seen, the timetable for EDIFACT message development can be slowed by the necessary process which considers the views of many interested parties. In some instances, companies have used the EDIFACT syntax and data elements to create their own messages, submitting them for official approval, or planning to modify them as necessary.

The following messages are in the first stages of official readiness. Appendix B shows the status of all messages under consideration as of October 1989.

- International Commercial Invoice—the first message to achieve UNSM status.
- Purchase Order—now in trial use.
- The International Forwarding and Transport Message—this message contains all information needed in the forwarding and transportation of any shipment, regardless of origin, destination or method of transportation.
- Acknowledgement/Rejection Advice—advises a message sender if a UNSM has been received or not.
- Customs Declaration—incorporates transportation and commercial invoice information, consolidating into one message the information carried on two U.S. entry documents, the European Single Administration Document (used for Pan-European trade) and the invoice.
- Customs Response—Used by Customs agencies to respond to the Customs Declaration message.
- Quality Data Message—used primarily by the chemical industry to exchange product test results between suppliers and customers.

C

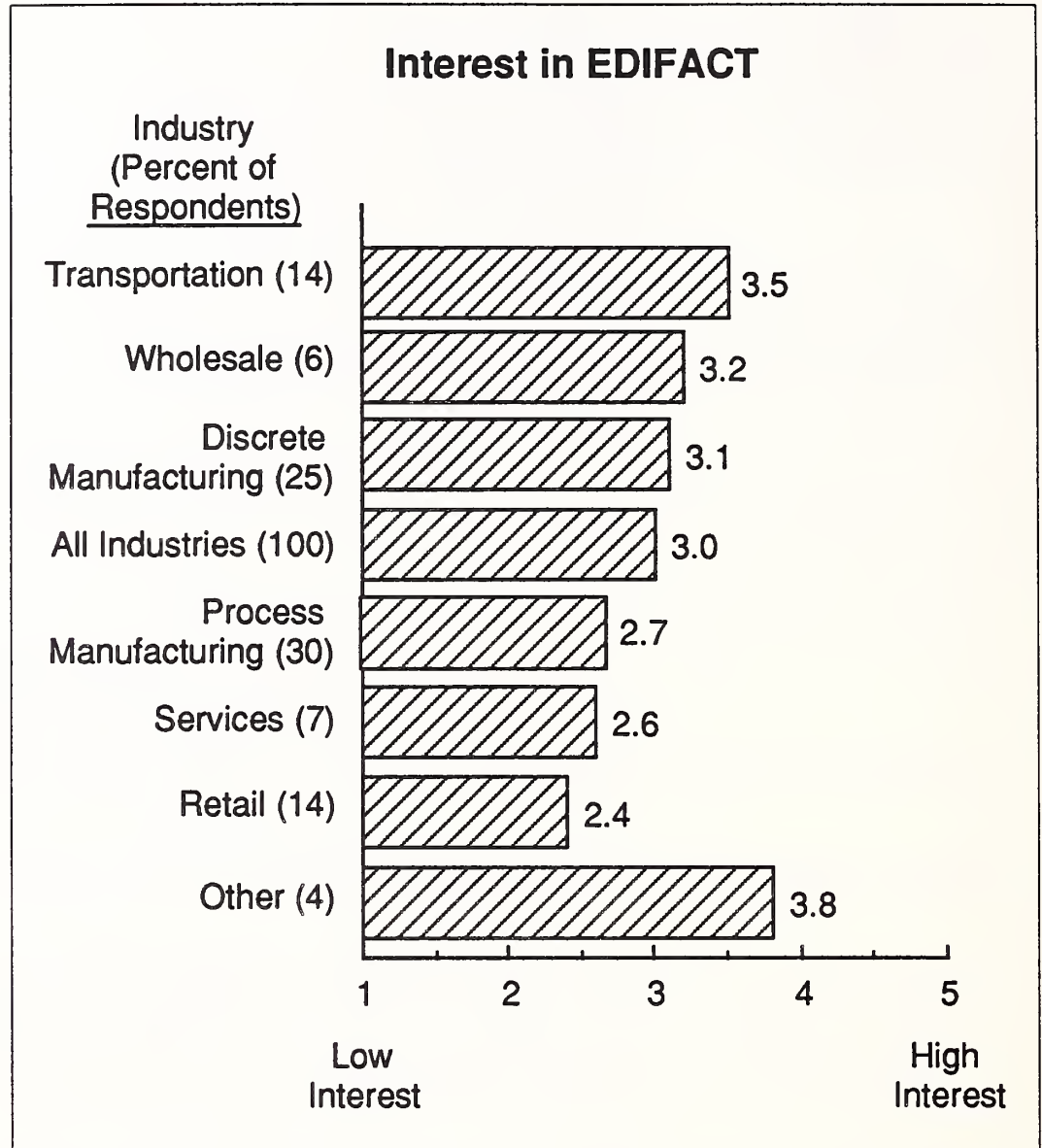
Degree of User Support for EDIFACT

According to the primary survey conducted for this report:

Nearly one-third of the active EDI users originally contacted for this survey had no knowledge of EDIFACT, or a vague understanding that it had something to do with international trade.

Users were moderately interested in the EDIFACT standard, as shown in Exhibit III-3.

EXHIBIT III-3



As shown in Exhibit III-4, most users in all industries believe that having a single, global standard for EDI is highly important, but there is some indication that they believe current procedures for the development of such standards are not as effective as they could be, as shown in Exhibit III-5. Also, users believe their interests are not well represented in EDIFACT development, as shown in Exhibit III-6.

EXHIBIT III-4

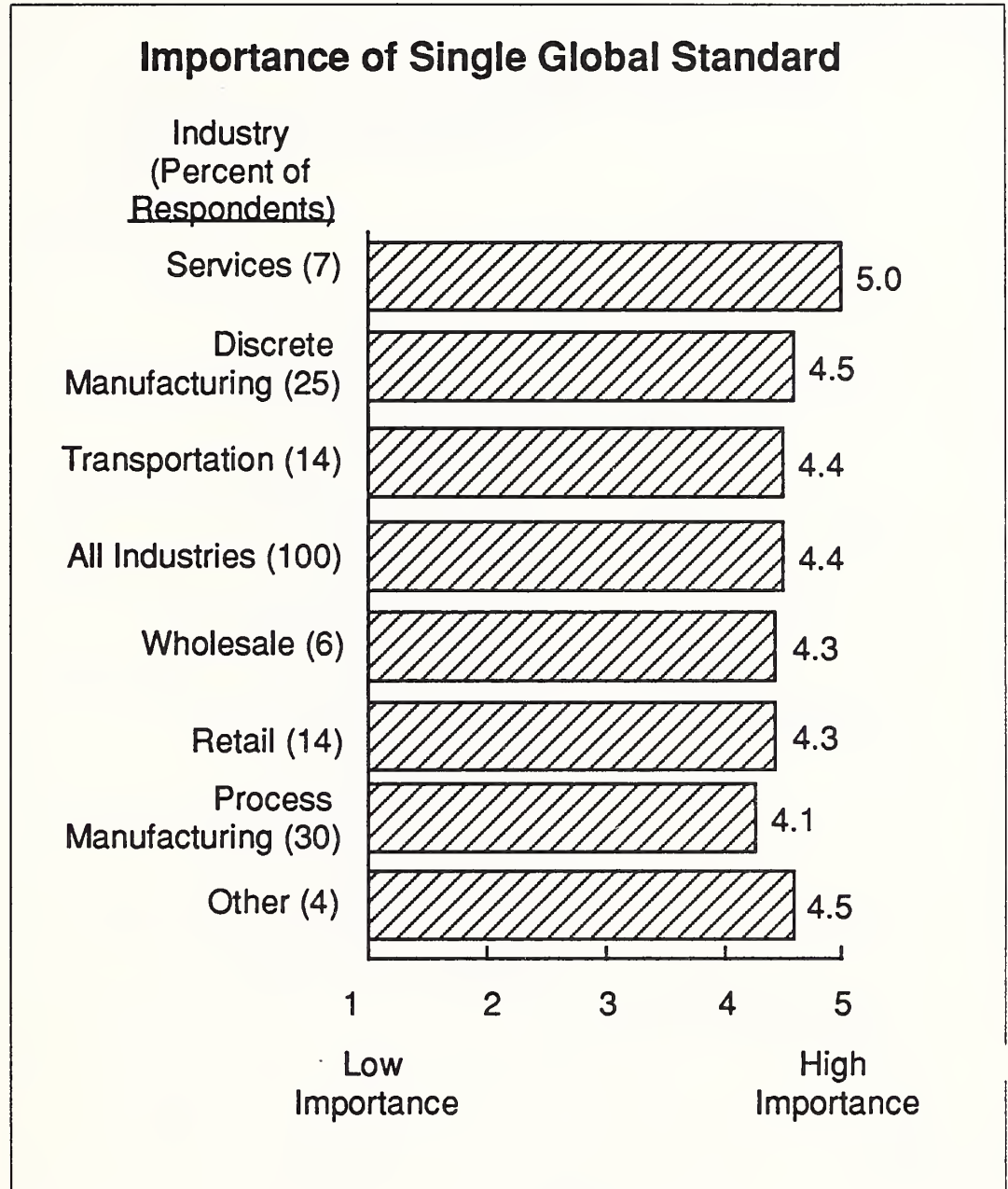


EXHIBIT III-5

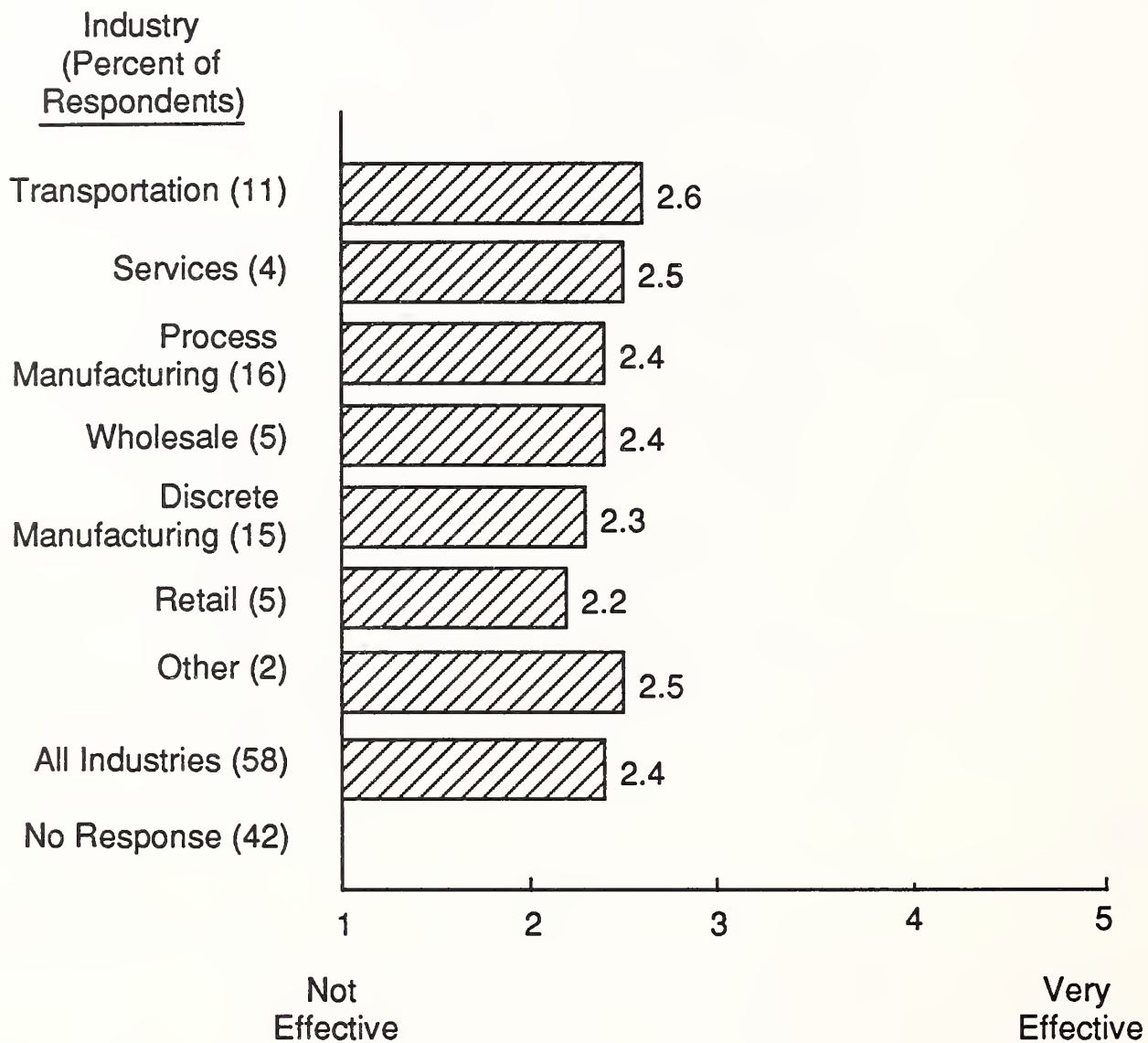
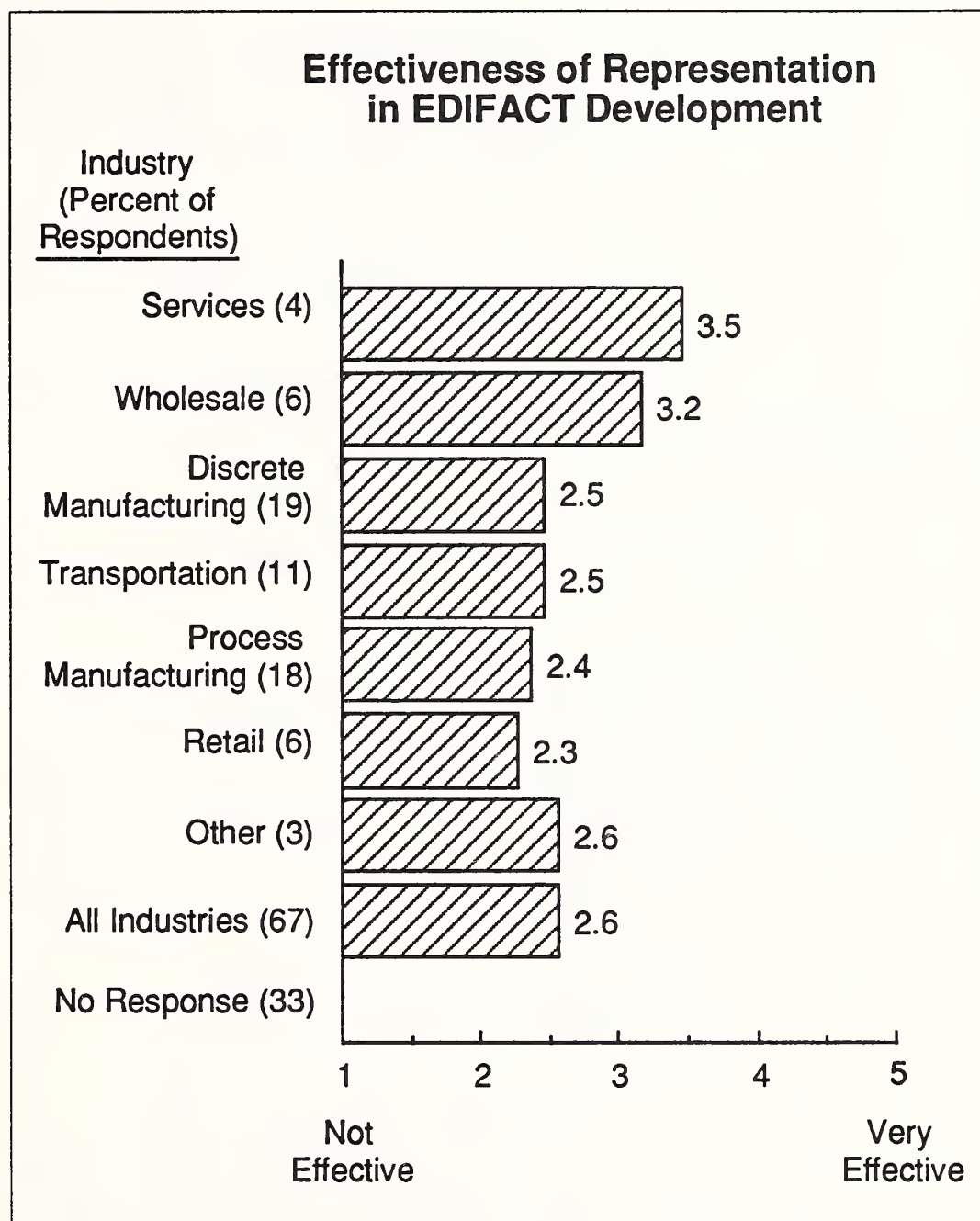
**Effectiveness of EDIFACT
Development Procedures**

EXHIBIT III-6



Users overwhelmingly believe that although there are different standards in various industries and various regions of the world, the problems can be resolved because of a general optimism and a belief in good will. Users believe that people working together can resolve their standards differences, and also believe that the business needs of a global economy will drive the compromises necessary to create a global EDI standard.

The need to adopt the EDIFACT standard does not invoke a high degree of urgency by the majority of active North American EDI users who are largely using ANSI X12 and TDCC formats. Seventy-six percent of respondents give it a low priority!

- The primary reason EDIFACT is not a priority is that trading partners are not requesting EDIFACT support, and secondarily, there is little company involvement in international trade. The third ranking reason for delays in implementing EDIFACT is that users are waiting for the standard to develop, mature and stabilize.
- Companies reporting a high priority for EDIFACT adoption indicate that their participation in the international marketplace is the primary motivation.
- Exhibits III-7 and -8 summarize the survey findings on the urgency of EDIFACT implementation.

EXHIBIT III-7

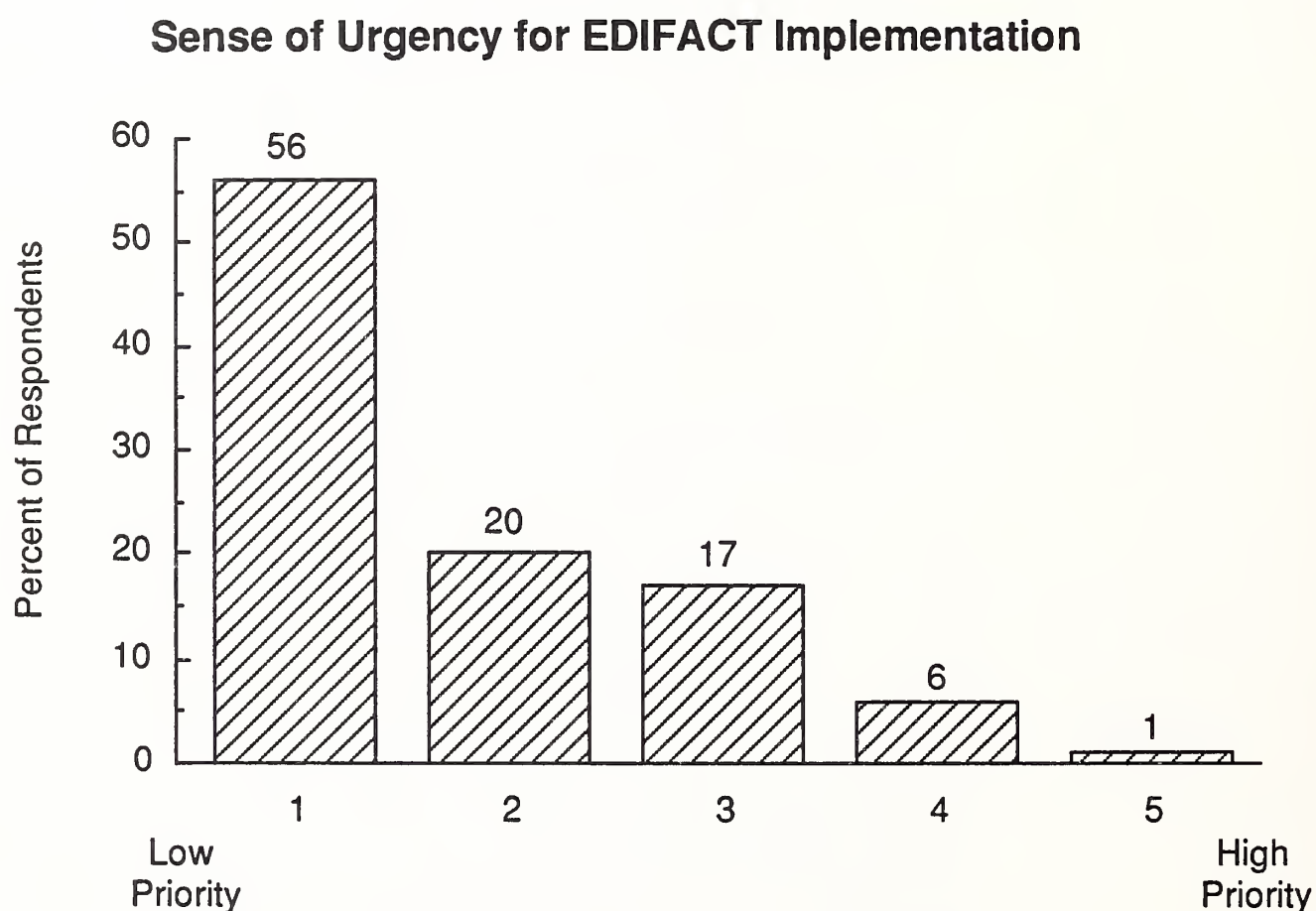


EXHIBIT III-8

Why EDIFACT Is a Low Priority

- Not needed by trading partners
- Higher priority for domestic EDI/X12
- Little international trade
- Waiting for EDIFACT to mature

When EDIFACT is a high priority
it is because of international trade

A majority of users interviewed (70 percent) were active in EDI standards development, primarily to stay informed and keep current, and also to influence the standards and to protect their self interests. Users who are inactive in standards development are satisfied with accepting the standards since they meet their needs, or their companies may lack the resources to be active. These findings are shown in Exhibits III-9a and III-9b.

EXHIBIT III-9a

Why Companies are Active in Standards Development

- For current information
- To influence standards
- To protect self interests
- Other reasons: altruism, educate partners, customer service, etc.

EXHIBIT III-9b

Why Companies are Not Active in Standards Development

- Satisfied with the standards
- Lack of corporate resources/interest
- Lack of industry-specific forum

Nearly 90 percent of companies interviewed are active in international trade, with most having over fifty international trading partners. However over 80% of these are not using EDI with their overseas trading partners.

Only 34 percent of users interviewed were correctly able to identify the United Nations as the sponsor of EDIFACT, as shown in Exhibit III-10. About 20 percent of users knew the number of EDIFACT transactions available, as shown in Exhibit III-11.

As shown in Exhibits III-12 and -13, users confess to having a relatively low level of understanding about EDIFACT and get most of their information about the standard from EDI associations, trade publications and industry associations, in that order. The preferred source of receiving EDIFACT information in the future was overwhelming identified as EDI associations, as shown in Exhibit III-14.

The leading concern regarding EDIFACT implementation and usage was the possible need for two systems—one for EDIFACT and the other for other EDI standards. This concern is not related to cost, however, but to the operational and management difficulties of maintaining and operating two systems. These concerns are ranked in Exhibit III-15.

The leading impediment to EDIFACT adoption is that users feel there are not enough documents covered by EDIFACT to be useful. Other impediments are that there is little EDIFACT software available and users do not understand EDIFACT technically. Finally, there is little support for the notion that EDIFACT adoption is being impeded because it is perceived as being primarily a European invention. Impediments to the adoption of EDIFACT are shown in Exhibit III-16.

EXHIBIT III-10

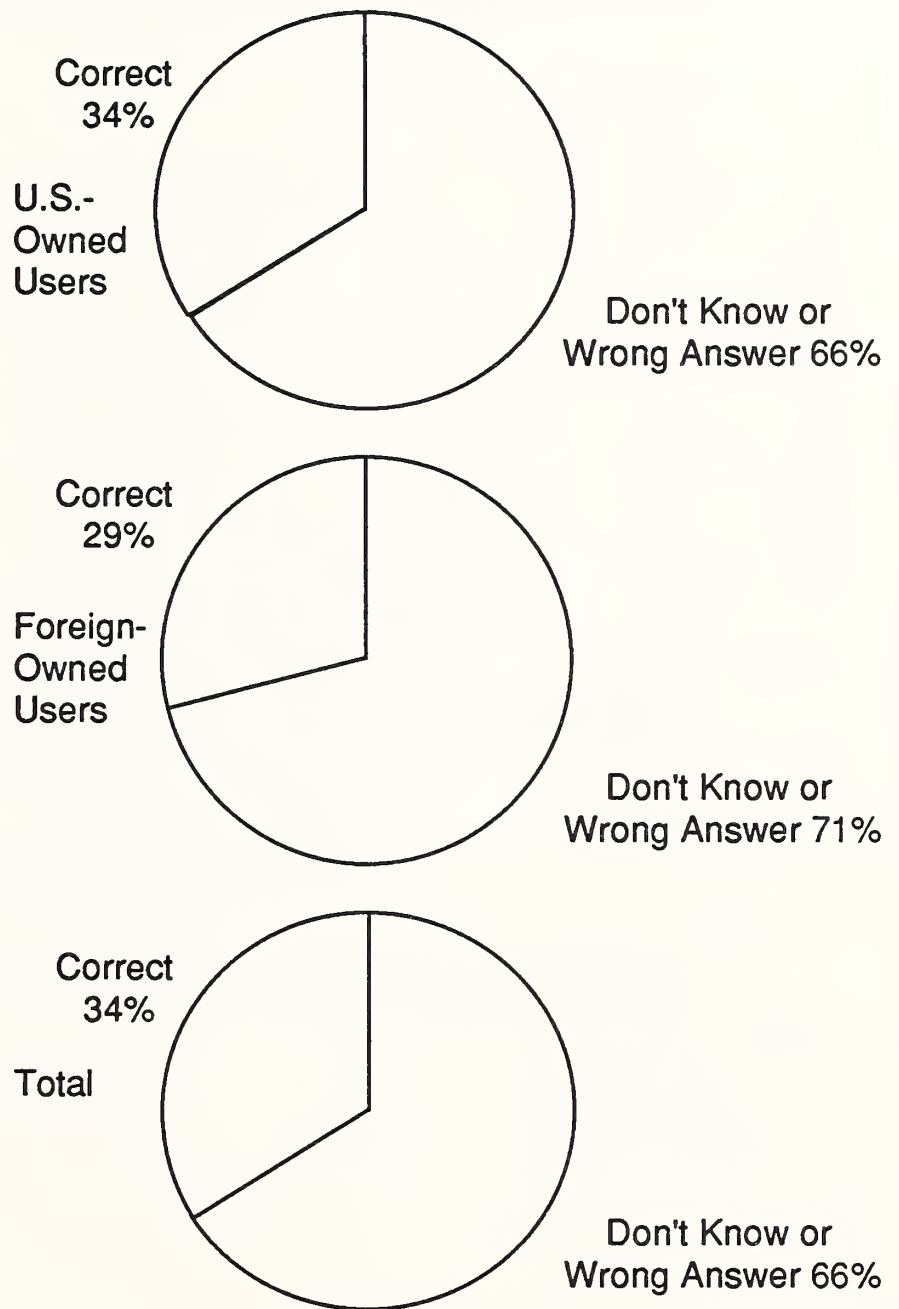
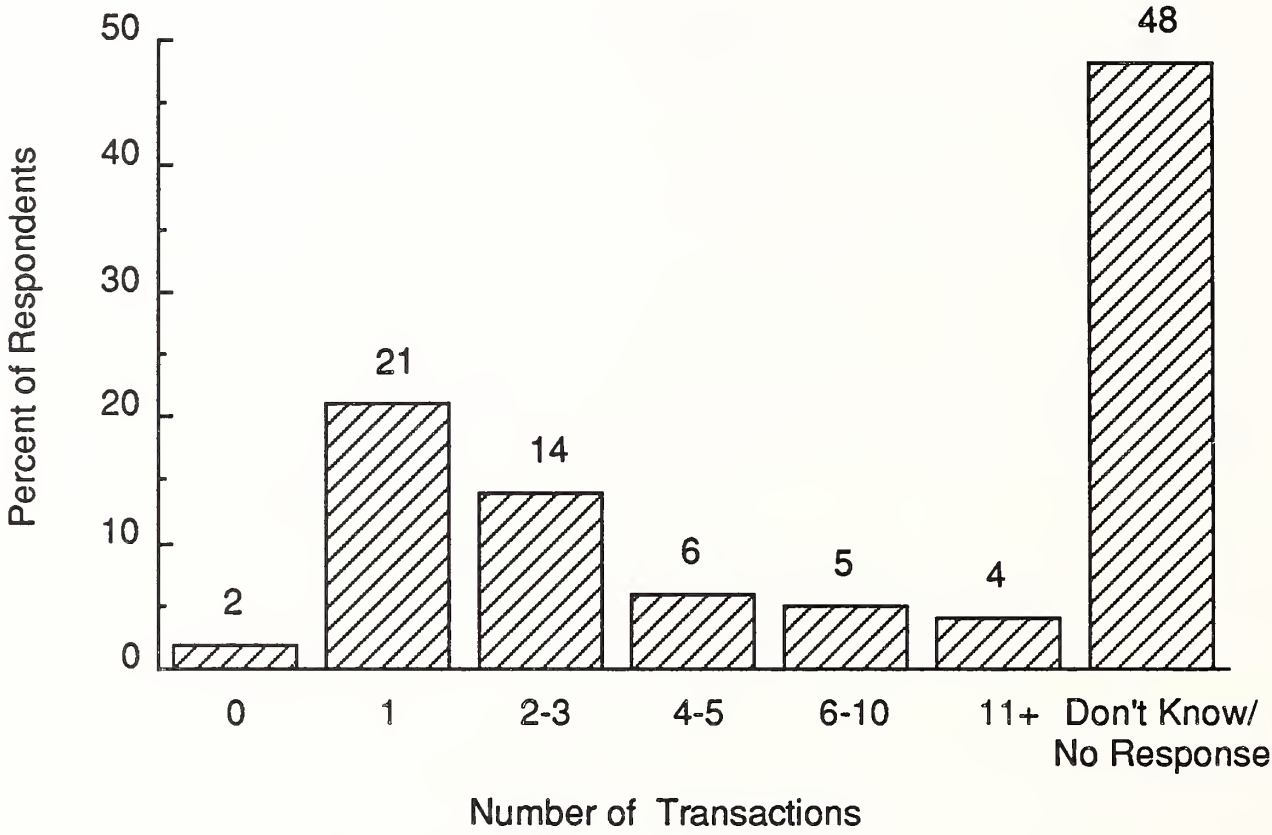
Ability to Identify UN as the Sponsor of EDIFACT

EXHIBIT III-11

Awareness of Availability of EDIFACT Transactions



The "most correct" answer at the time of the survey was "1".

EXHIBIT III-12

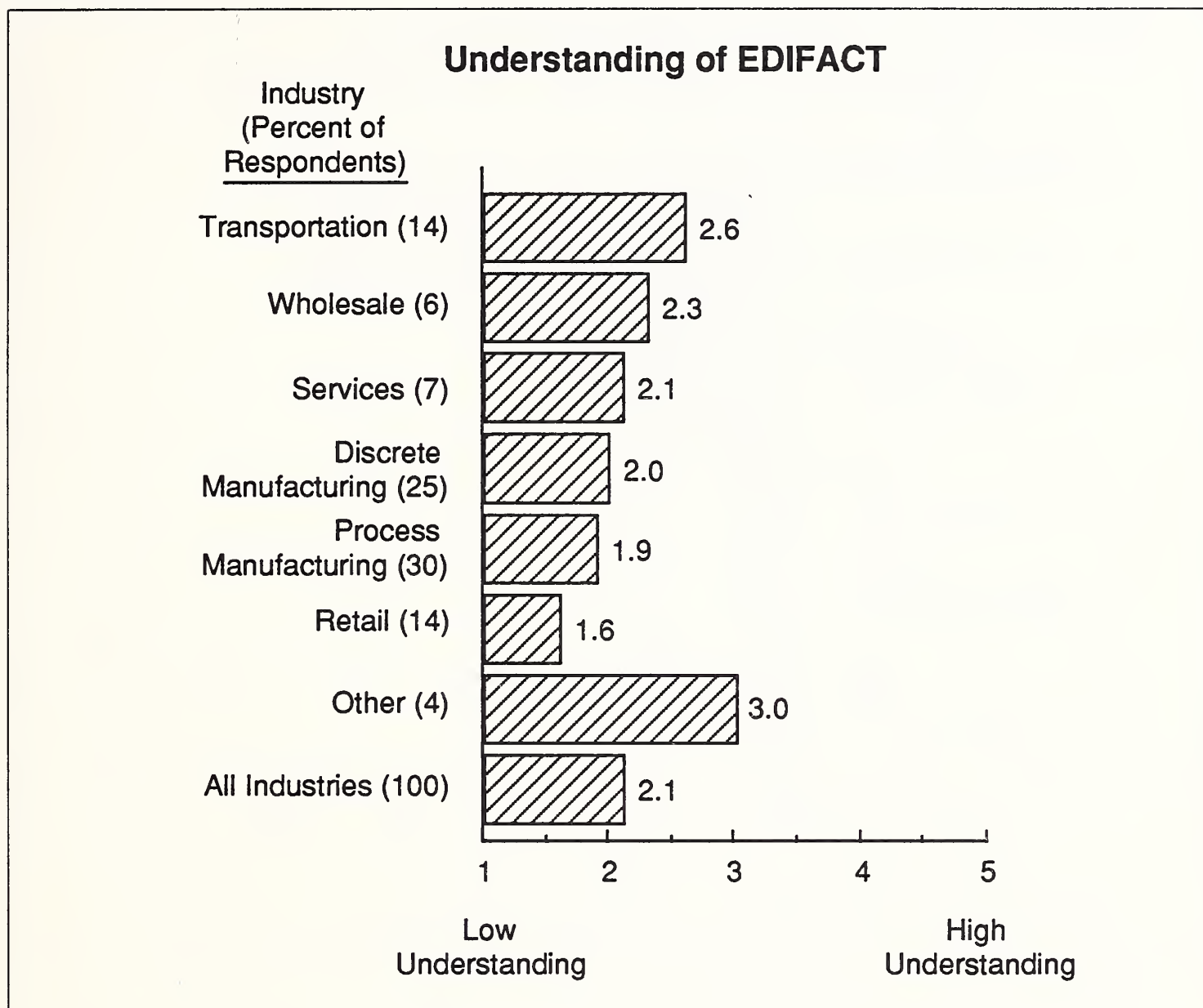


EXHIBIT III-13

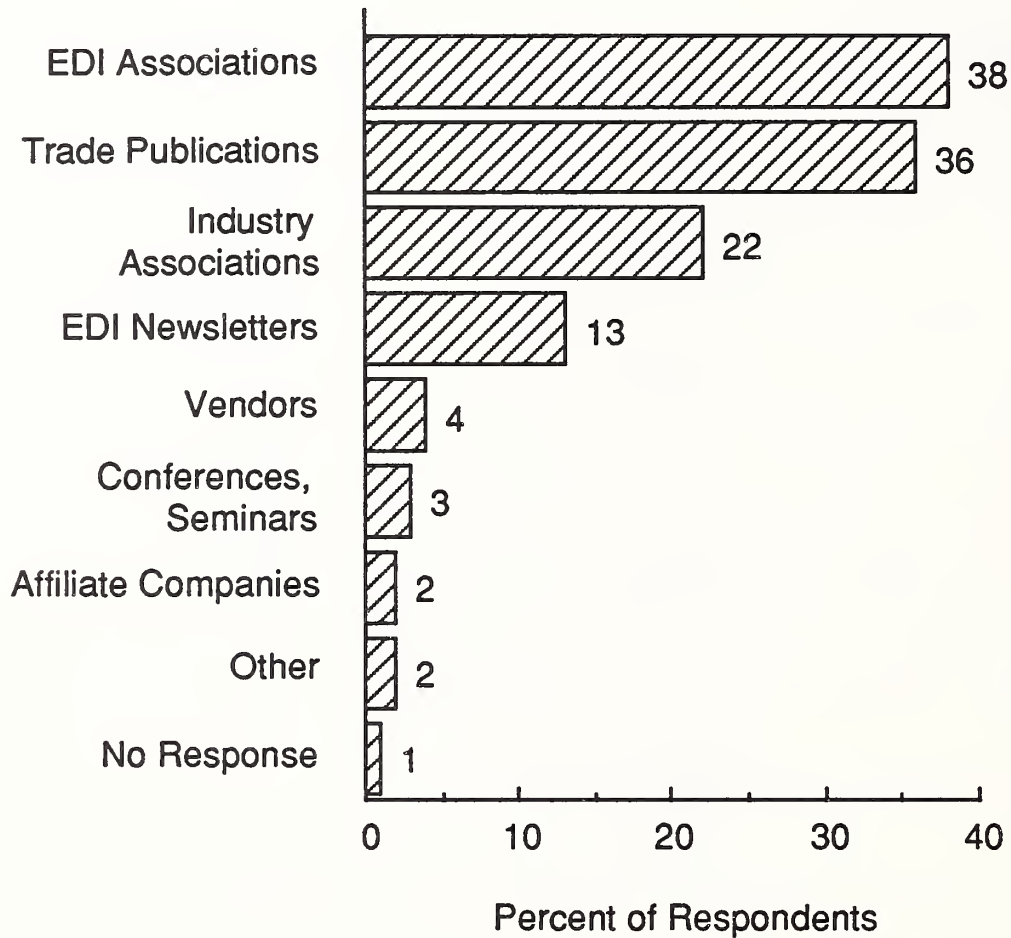
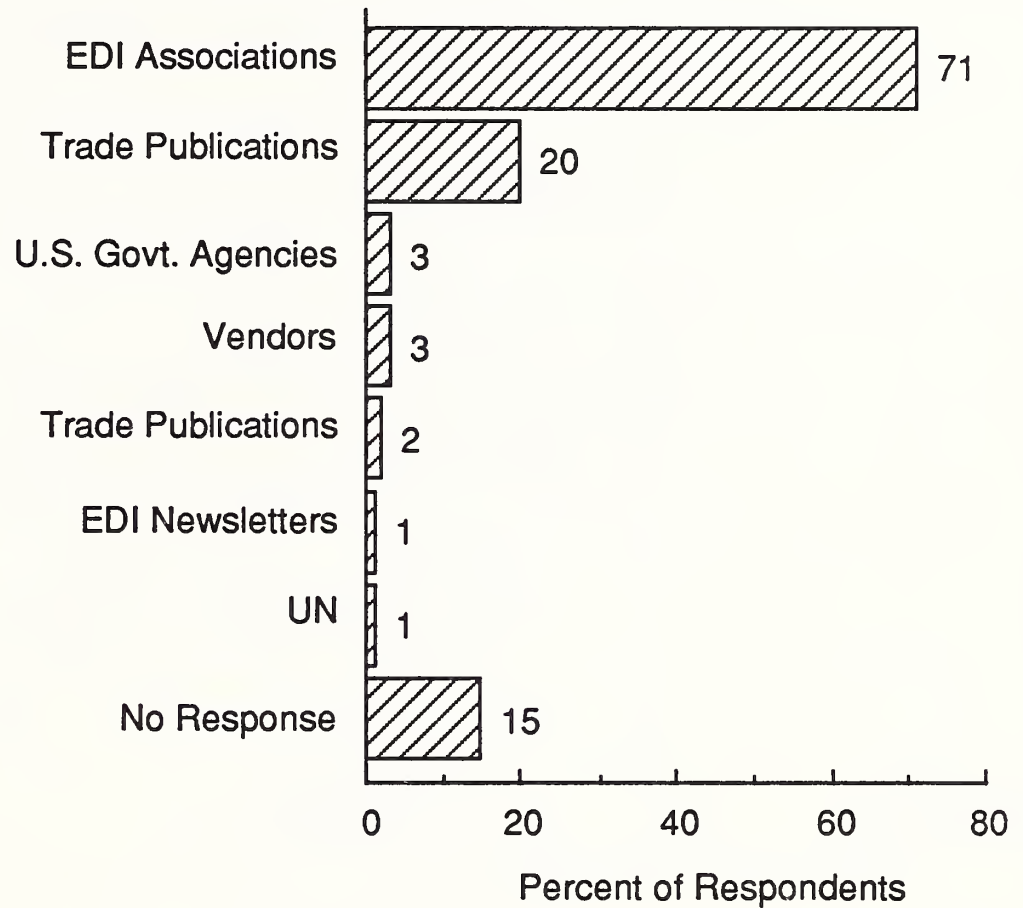
**EDIFACT Information Sources
(Where Users Currently Get Information From)**

EXHIBIT III-14

**Preferred Sources of EDIFACT Information
(Where Users Would Like to Get Information)**

(More than one choice possible)

EXHIBIT III-15

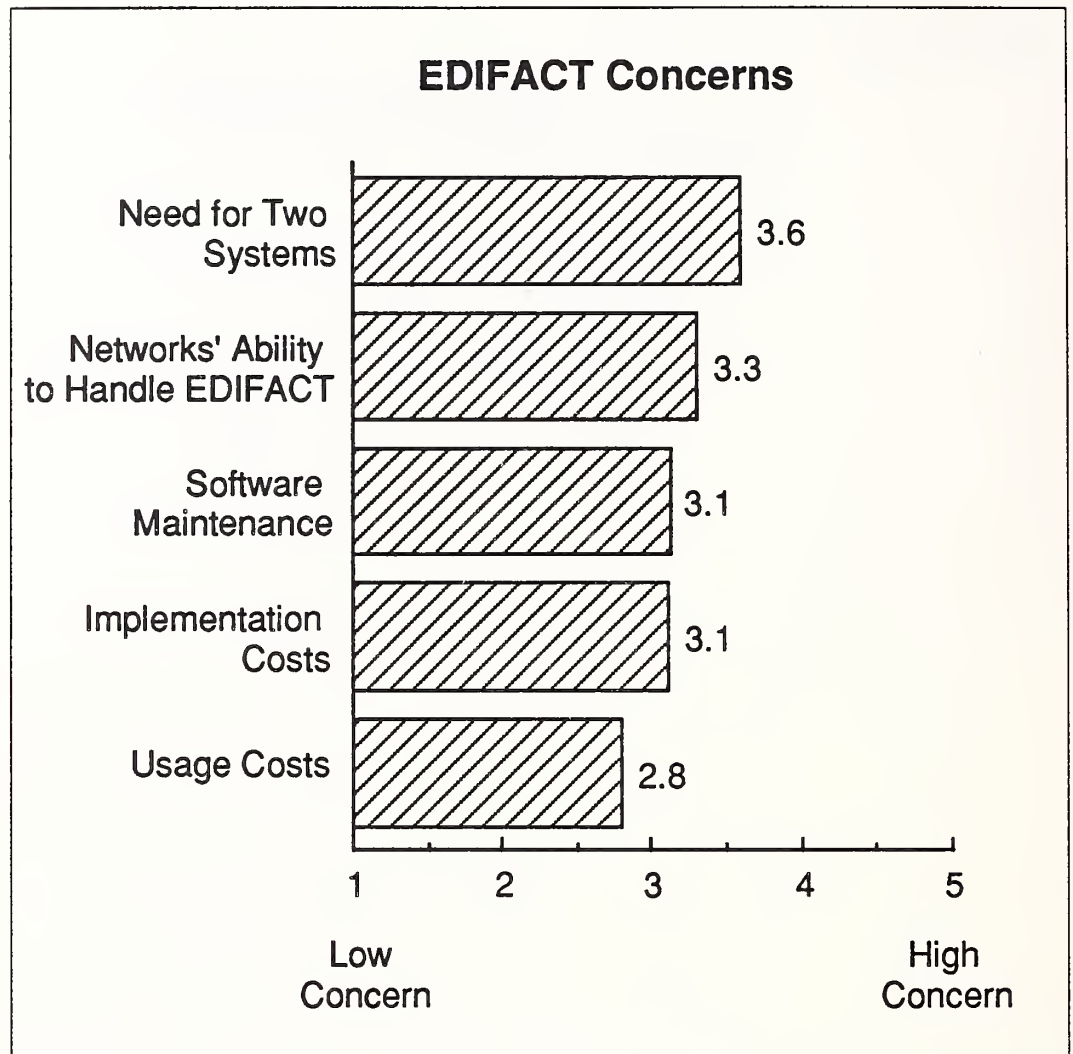
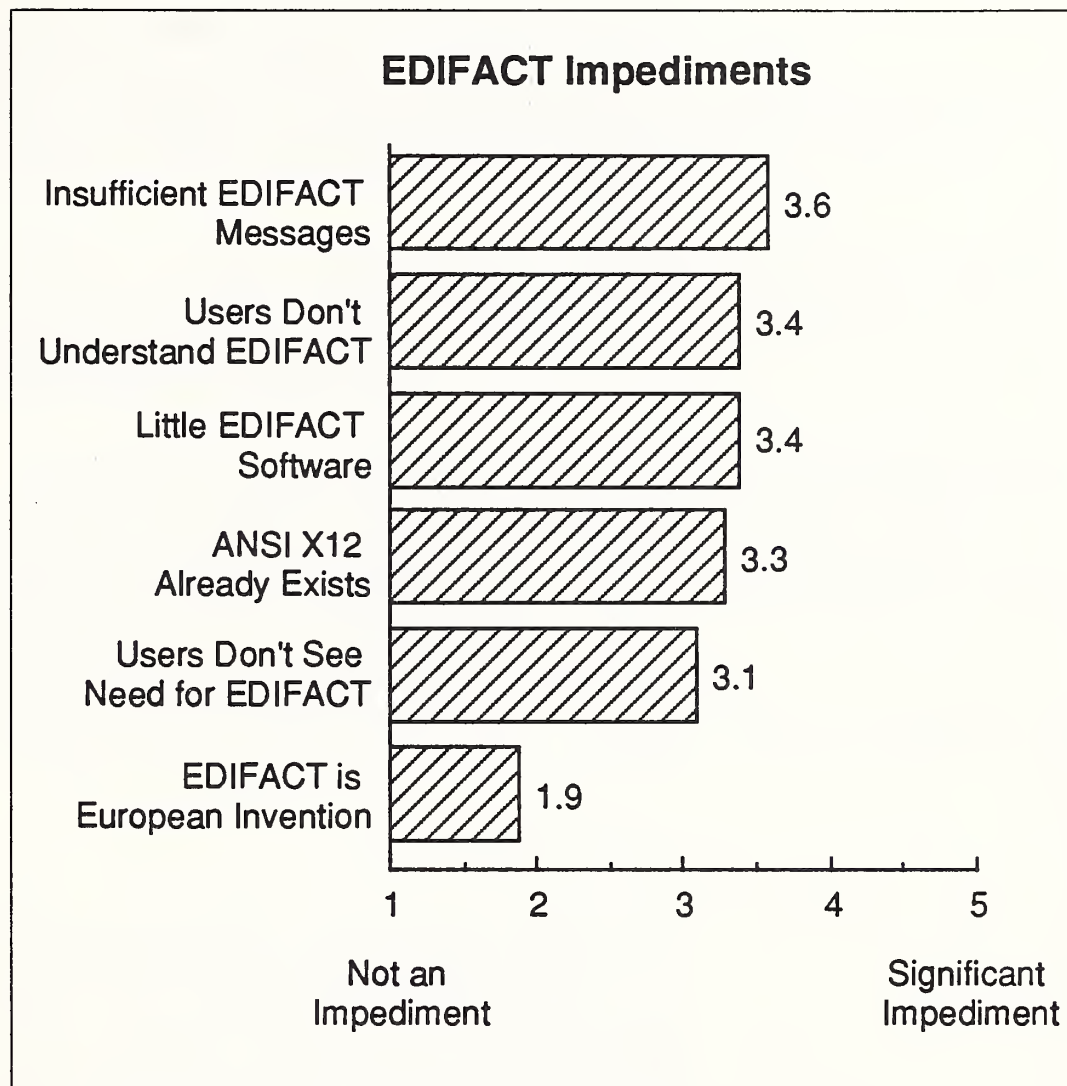


EXHIBIT III-16



To summarize the current situation, the research shows that the vast majority of North American users are not using EDIFACT standards. There are few UNSMs available for use, although several are being used in trial programs involving international trade by a few multinational corporations including North American Phillips, Eveready Battery, Texas Instruments, Johnson and Johnson, and Ciba-Geigy Corporation.

Generally, larger companies already using X12 or other EDI formats have less interest in changing to EDIFACT, particularly if they are not trading with European companies.

D

North American EDIFACT Users' Perspectives

Five North American users of EDIFACT were surveyed for this report. These companies were all in the discrete manufacturing sector, and four were U.S. owned, while one had foreign ownership.

The companies were mature users of EDI, with most having five or more years' experience; one was involved in EDI for three years. All are in-

volved in international trade with a large number of overseas trading partners. In one case, fewer than five international trading partners were involved with the subject company on an EDI basis, while three companies had over 20 such relationships. One company was using EDI (and EDIFACT) to communicate with a trade service, specifically, a customs broker.

Three companies decided to implement EDIFACT because they believe it is a global standard, while two companies had to implement the standard because it was required by their international trading partners.

1. Sources of EDIFACT Information

While the larger, general EDI user survey found that most users get EDIFACT information from EDI associations and other sources, the North American EDIFACT-using companies get most of their information from their affiliated companies in Europe where their employees participate in EDIFACT development. However, respondents acknowledge that EDIFACT information should be coming from EDI associations.

2. Awareness Levels

Not surprisingly, this limited group of five EDIFACT users exhibited high levels of interest in, and understanding of, EDIFACT. They feel that a single global EDI standard is very important, and generally feel their interests are being represented effectively in the development of EDIFACT. However, there was some indication that the current procedures for developing worldwide standards could use some improvement. The specific recommendations made were to establish a single, worldwide EDI data dictionary and syntax to be voted on by the various international standards bodies, and to bring ANSI and EDIFACT procedures into synchronization.

Although active in EDIFACT, only three of the five questioned EDI managers could correctly identify the United Nations as the sponsor of EDIFACT; one identified the U.S. Department of Transportation as the sponsor.

3. Ease of Use Issues

Users reported few or no problems when they implemented EDIFACT. The problems were minor in nature and were not EDIFACT related. These problems were ascribed to the usual difficulties faced in implementing a new computer system.

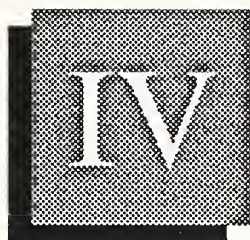
4. Concerns and Impediments

The leading concern of this group regarding the EDIFACT standard was the possible need to have two systems, followed by the ability of the networks to handle EDIFACT messages.

The greatest impediments identified to adoption of EDIFACT were the existence of EDI standards like ANSI X12 already being used, and the perception or observation that there is little software available that supports EDIFACT translations.

Uniformly, the EDIFACT users feel that the problems associated with establishing an international standard for EDI can be resolved, primarily because of business needs. Said one respondent, "We have common telephone protocols, computer architectures and operating systems. We have common auto parts. With EDI, we're not really doing anything that different."

The next chapter further examines the technical aspects of EDIFACT and compares the standard to others.



Getting Technical About EDIFACT





Getting Technical About EDIFACT

A

EDIFACT Compared to ANSI X12

Although it is intended to be a convergence of X12 and a European EDI standard, the EDIFACT syntax, or technical grammatical rules, is different from ANSI X12 in specific ways as noted in this chapter.

EDIFACT starts with different data element glossaries (the basic definition of the data contained in the transaction sets), and uses compound data elements (ANSI X12 only allows one item of information in a data element) and different communications message headers.

EDIFACT is based on the UN/GTDI syntax, which is used by several EDI standards communities such as TRADACOMS. This syntax (designated ISO 9735) is used as the foundation for creating EDI messages, using the United Nations Trade Data Element Directory (UN/TDED) which is the International Standards Organization standard 7372 (ISO 7372).

1. What is Needed for Standards Convergence

In July 1988, ANSI X12 voted endorsement of a single universal EDI standard, setting into motion a planned migration from X12 to EDIFACT, or at the least, a convergence between the two standards.

To assist in this process, the ANSI X12 executive committee directed the preparation of an analysis itemizing the differences between the ANSI X12 message format and EDIFACT. The document offered thirty specific syntax-design changes (17 for ANSI X12 and 13 for EDIFACT) that would allow the two to converge. The entire document is published as Appendix C of this report. Below is a brief synopsis of the differences between the two standards.

- **Character Sets:** ANSI allows more types of characters than EDIFACT. Of particular note is the absence of international currency signs in

EDIFACT including the “\$” sign which ANSI allows. (This factor is not significant. Even though one would assume currency symbols would be useful, particularly in international trade, convention calls for using a three letter code to show country and currency. For example, USD means United States Dollars.)

- **Control Characters:** Control characters delimit portions of the message identifying, for example, when a segment or data field begins and ends. ANSI has three control characters; EDIFACT has five with a potential for six. One of EDIFACT’s control characters specifies decimal fields which is useful in cross-border EDI transactions where currency values are used. EDIFACT also assumes default values for its control characters which ANSI does not.
- **Data Elements:** ANSI defines six kinds of data elements, EDIFACT defines three. ANSI’s data elements are: real decimal, implied decimal, string, date, time and identifier. EDIFACT’s data elements are: alphabetic, numeric and alpha-numeric. EDIFACT allows element values to be simple or composite. The composite is a group of distinct but related values in a single element. Both syntaxes have fixed and variable length data elements.
- **Segments:** X12 segments are delimited by a 2 or 3 digit label at the beginning and a single control character at the end of the segment while EDIFACT uses a composite data element that identifies the segment and may state the number of repeating data elements that are in it. EDIFACT’s segment is terminated by a single control character. EDIFACT’s syntax has no counterpart to X12’s “conditional” data element - a data element whose existence depends on the value or existence of another data element. The number of data elements allowed to appear in each standard’s syntax is fixed by the segment’s definition but may vary in use.
- **Transaction Sets/Messages:** The differences between the two syntaxes on the overall design of transaction sets are small. Both syntaxes require the user to place segments in a predefined sequential structure. Transaction sets in both standards are composed of a message header, trailer and one or more data segments. The major difference is that X12 requires a beginning segment in addition to the header, trailer and data segments.
- **Functional Groups:** The X12 syntax is more precise than EDIFACT in this area. It requires transaction sets of similar functions (e.g. purchase orders, shipping notices, etc.) to be grouped into functional groups. An X12 functional group is designated by a header and a trailer. Although EDIFACT stipulates a functional group (also designated by a header

and a trailer), it does not require its use. Furthermore, the EDIFACT documentation does not specifically define what "similar functioning transaction sets" are.

- **Control Segments:** The two structures for interchange control are syntactically dissimilar although both convey the same basic semantic content.

The syntax differences between EDIFACT and ANSI X12 are summarized in Exhibit IV-1.

EXHIBIT IV-1

EDIFACT, ANSI X12—Comparison Of Syntax Differences

ITEM	EDIFACT	ANSI X12
Character Sets	Absence of international currency signs including "\$". Uses USD (United States Dollars) for "\$"	More characters than EDIFACT. Allows "\$"
Control Characters	5/6	3
Data Elements	Three: Alphabetic, numerical, alphanumeric	Six: Real decimal, implied decimal, string, date, time, identifier
Segments	Uses composite data element to identify a segment. Does not have "conditional" data element	Delimited by 2/3 digit label at beginning of segment. Has "conditional" data element
Transaction Sets/messages	Generally similar to ANSI X12, e.g., transaction sets in both standards composed of message headers, trailer and one or more data elements	Major difference: Requires beginning segment
Functional Groups	Allows functional groups, but syntax not clearly defined	Allows functional groups. Syntax more precise

2. Recommended Changes to EDIFACT and ANSI X12

Recommendations as to what technical changes are needed to bring the EDIFACT syntax and ANSI X12 syntax together were made in the comparative paper. It is expected that these recommendations can be

implemented through the X12 data maintenance procedures, while changes to the EDIFACT syntax need to be handled through the Technical Advisory Group representing U.S. interests in the International Standards Organization, and through the North American Rapporteur to UN/Working Party 4.

Among the changes required in ANSI X12 are items such as creating a subset of the current extended X12 character set to identify national characters such as “#” and “\$” which are not to be used internationally, unless the trading partners have made arrangements to do so.

The recommended changes to the EDIFACT syntax include suppressing all leading zeroes, including those preceding decimal functions, and the elimination of explicit nesting.

The recommendations call for both X12 and EDIFACT representatives to participate in a working group to prepare the 1992 release of the new syntax and to create a common, unified designer's guide. This working group will convene in January 1990 to review ISO 9730 (the EDIFACT syntax document).

B

EDIFACT Compared to TRADACOMS

It might be useful to compare the differences between EDIFACT and a widely used European standard, TRADACOMS. TRADACOMS is primarily used in the U.K. with related standards, also based on the same syntax, being used elsewhere in Europe.

The EDIFACT standard documents are interdependent, and require a number of standards to interpret, understand and use the standards. These underlying standards are:

- UN/EDIFACT Syntax Rules (ISO 9735)
- UN Trade Data Element Directory (UNTDIED - ISO 7372)
- UN Trade Data Interchange Directory (UNTDID)

A recent (September 1989) meeting of the EDIFACT group decided to publish all these related standards in a single document to simplify the process of message creation and maintenance.

- Syntax Differences: The EDIFACT syntax was derived largely from the UN/TDI syntax, but combined with features from the ANSI X12 syntax. The new syntax received rapid approval from the International Standards Organization, creating ISO 9735.

There are differences in the syntax of EDIFACT and TRADACOMS, as determined by the British VANGUARD project, and shown in Exhibit IV-2.

EXHIBIT IV-2

EDIFACT, TRADACOMS—Comparison of Syntax Differences

ITEM	EDIFACT	TRADACOMS
Character	Default is character set A. Other sets available. Alternative separators available	Subset of EDIFACT Character set A. Single separator set
Numbers	Explicit decimals	Decimal place implied
Data Elements	Simple/compound numeric tags=the nosm	Simple/compound alphabetic tags
Segment Tag/Data Delineator	TAG + data + data'	TAG + data + data'
Segment Nesting Indications	Explicit or implicit nesting, but to date all messages use implicit technique	Segment nesting hierarchy explicitly indicated
Sectional Control	Message may be divided	Unnecessary for clarity of layout into sections
Message Header and Trailer Segments		Subset of EDIFACT
Transmission Header/Trailer Segments		Subset of EDIFACT
Functional Grouping	Allows messages of same type to be functionally grouped	Messages can be batched within a transmission

Source: Vanguard

- **Message Differences:** TRADACOMS messages consist of three components: a header message, a details message and a trailer message. This allows for repetitive and static information (such as sender's address) to be transmitted once while varying information (such as delivery instructions) can be repeated within the details section of the message without repeating the static information.

EDIFACT messages carry a single transaction, with the body of the transaction associated in a one-to-one relationship with the fixed, static reference information (such as sender's address). In other words, each transaction carries redundant information (overhead) that would not be found in a comparable TRADACOMS message.

The differences are because TRADACOMS mimics domestic practices where, for example, a retailer would send a single supplier a large series of orders, while EDIFACT's structure follows international import/export practices where transactions are more complex and carry higher values, but where the number of transaction messages sent may be fewer.

TRADACOMS also has some unique, U.K. fields. For example, the invoice has a specific space for the Value Added Tax (VAT), while the EDIFACT invoice has no need for this field.

- **Qualifiers:** EDIFACT is designed to accommodate the needs of a variety of interests and is therefore designed to be very flexible. To avoid the complexity of providing a specific, dedicated data element for each information item needed by a specific user, EDIFACT uses qualifiers. Using qualifiers, multiple data elements covering a similar function are replaced with a single data element which is qualified, or specified as to its precise meaning by use of the qualifier code. For example, instead of individual data elements for order date, invoice date, dispatch date, etc., a single element "date" is qualified by various code values whereby an 01 would mean document date, and other codes would mean other types of dates. This scheme requires that the relevant codes and their meanings be maintained by the user's EDI software.

TRADACOMS does not need qualifiers, since simpler domestic trade requirements make it possible to dedicate data elements to meet the trading partner's needs.

- **Segment Groups:** EDIFACT UNSMs are more complex than TRADACOMS. For example, the EDIFACT UNSM purchase order provides for 135 segments as the basic building blocks while TRADACOMS has 16 such segments. In EDIFACT, segments can be grouped into related sections, and when necessary, repeated.
- **What are the Significant Differences/Similarities:** The structure and design methods used for EDIFACT and the U.K.'s TRADACOMS standards are different. The EDIFACT syntax is derived from the same syntax used by TRADACOMS (with ANSI X12 syntax elements thrown in), but the unique use of qualifiers in EDIFACT and the fact that an EDIFACT message carries a complete transaction within a single message while TRADACOMS makes use of headers and trailers

for static, standard information (such as sender's address), and a details message for variable information, are the most significant structural changes.

However, the most significant similarity is this: An EDIFACT message can be created from the same core information that is used to create a TRADACOMS message, just as an EDIFACT message can be created from the same data used for an ANSI X12 message.

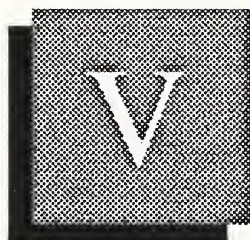
C

EDIFACT Costs

Users have shown that they are not very concerned about the costs of implementing EDI in general, and EDIFACT in particular. The concern over the possible need to maintain dual systems does represent an operational and management cost, but the expenses of software incorporating EDIFACT translation, or the use of EDI third party networks for EDIFACT transmissions are not seen as a significant factor.

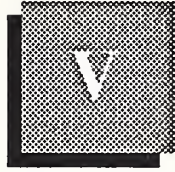
EDI software has generally price stabilized while new features (including EDIFACT support) have been added. The competitive network services involved have also found their price levels. International transmissions often carry a premium (or "upcharge"), but these costs are recognized as lower than the equivalent paper-based methods now being used.

The next chapter examines the role, current and projected, for EDI network services and software providers.



The Role of Networks and Software in EDIFACT





The Role of Networks and Software in EDIFACT

A

Can the Vendors Get Together?

At the first International Congress of EDI Users held in the summer of 1989, EDI software and service providers from around the world were invited to participate in a vendors meeting, initiated by a representative of an Australian EDI service provider. The purpose of the meeting was to discuss ways to support global EDI implementation "in an orderly and timely fashion." The concerns that were to be addressed included the development of "EDIFACT-based" or "EDIFACT-compliant" messages which are outside the list of 30 or so officially submitted UNSMs being developed and tested.

"Without a coordinated and common approach," wrote the organizers, "we risk the situation whereby 'EDIFACT' implementations in some countries and/or with some network operators/software houses will be incompatible with other countries/operators/software, with obvious and most damaging customer reactions. It is essential, if the cause of global EDI is not to suffer serious and damaging setbacks, that the key EDI industry associations work together to ensure that this situation does not arise."

The approach proposed seems similar to that recently taken by the X.400 Message Handling System development community where a standardized Application Program Interface was developed. However, the results of this first International EDI Vendors Forum appear to have been mixed. Some potential participants chose not to attend, in part because of anti-trust concerns. The end-result of the meeting was agreement to disseminate standards documentation throughout the vendor community to aid compliance. The group resolved it would not advocate a position, but would collect information and identify issues for discussion at its meeting next year, and in regional forums.

Clearly, a unified approach to EDIFACT implementation and support would obviate some of the difficulties that have occurred in the past where multiple varieties of a supposedly uniform “standard” exist.

B

Network Services and EDIFACT

In general, the active EDI users interviewed for this study voiced some concern about the networks ability to handle EDIFACT standard messages. As a matter of fact, testing to make certain that the codes and characters used within standard-based messages do not trigger unexpected results is all that is necessary to certify store and forward mail-boxing and data communications services for EDIFACT. The networks also need to invest in developing EDI-related applications such as specialized reports; however since these advanced services carry higher margins of profit, there is a motivation to do so.

1. International Services and EDIFACT

The use of the EDIFACT format implies that EDI will be used for international trade. For North American users, international EDI can be accomplished through direct connections, private networks or, most efficiently, through third party networks which support international EDI services. Increasingly, the leading third parties are providing such services in association with subsidiaries, affiliates, joint ventures, or through technology licensing agreements.

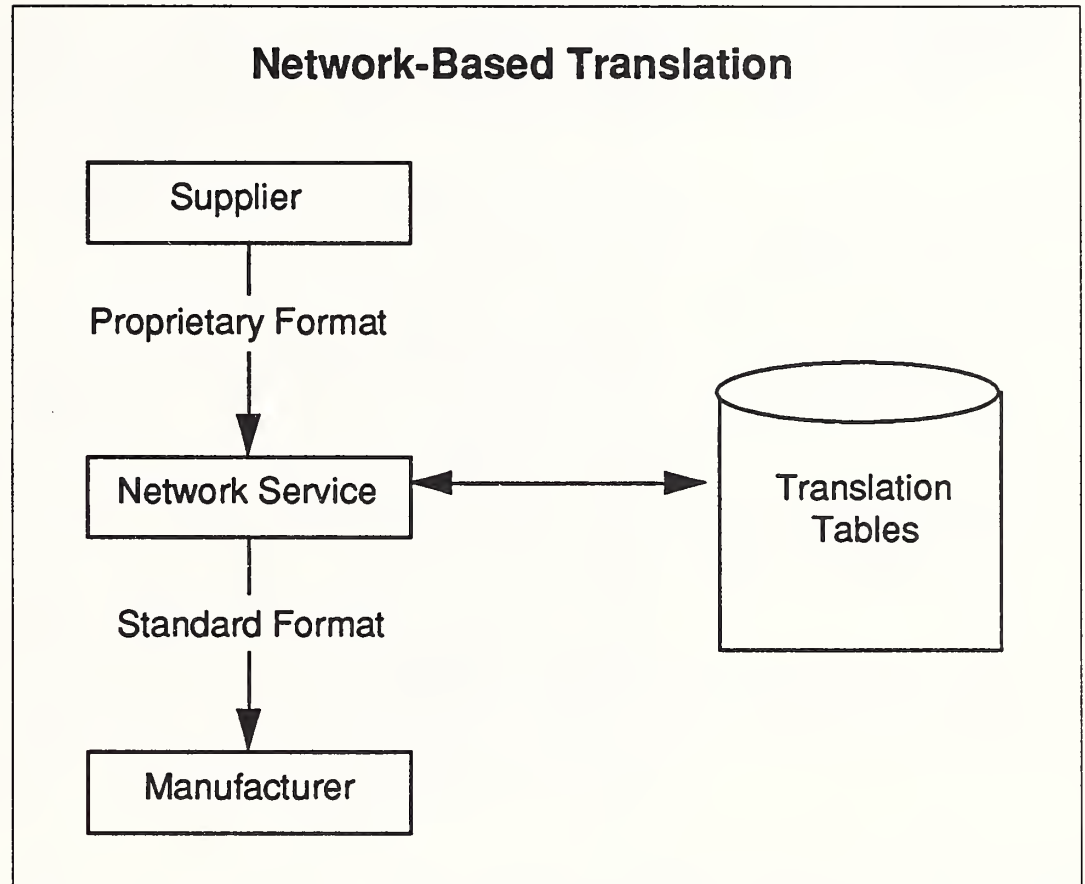
2. On-Network EDIFACT Translation

For the most part, translation between a company's internal formats to a public standard such as EDIFACT is best accomplished via a modular, add-on EDI software package. However, for situations requiring support for a specific format on an occasional or low volume basis, on-network translation (Exhibit V-1) may be more cost effective and/or convenient. The availability of on-network translation is also useful prior to installation of an in-house translator.

Accordingly, for companies with low volumes of EDIFACT traffic, or who are newly involved in international trade, on-network translation may be the best alternative. In this scenario, the EDIFACT formats would not need to be updated by the user organization; rather, the network maintains them. Further, the networks will perform compliance checking to ensure adherence to a given standard.

Only a few of the third party networks provide on-network translation: GE Information Services, Sterling Software Ordernet and Kleinschmidt are among them. In at least one case (Ordernet), users are charged a flat monthly fee for any and all translation services. The other network services may build on-network translation capability for a specific user, at a price.

EXHIBIT V-1



As the EDIFACT standard matures, and as acceptance of centralized standards grows, the need for on-network translation will likely diminish. Rather, users will look to software to perform their needed translations.

C

EDIFACT
Translation Software

In simplest terms, “an EDI translator is a translator is a translator.” Unless the software tables are hard-coded, the basic translation function is adaptable to virtually any data format conversion based on the look-up tables installed in the software.

The leading EDI software providers are providing support for EDIFACT within their translators. The level of support and the types of transactions supported may vary based on the availability of specific UNSMs as proposals, drafts released for trial use or as final, approved messages. Most software vendors work with their customers to determine standards policy regarding version and level support, and often work with the customers to develop the actual tables needed to support specific messages. In some cases, existing EDI software providers are remarketing European EDIFACT software.

D**North American
Vendor Survey**

Both network and software vendors were interviewed on EDIFACT issues. The network vendors surveyed were all involved in international EDI, mainly with Western Europe and the Pacific Rim, and to a lesser extent Australia. All networks support EDIFACT. Of the vendors surveyed only one offers on-network translation. Vendors do not see a need for this service due to the availability of software products that can handle destination-specific transactions.

All but a few software vendors surveyed have overseas users, in Western Europe, the Pacific Rim, Australia, and to a lesser extent South and Central America. Most of the vendors support EDIFACT or are planning to within the next year. About half the vendors interviewed unequivocally stated their support for the EDIFACT standard, the other half are more influenced by the needs of their user communities.

Vendors give low ratings to users' interest in EDIFACT, their understanding of EDIFACT, and their sense of urgency for implementing the standard. This finding reflects more on user characteristics rather than on the EDIFACT standard itself. Users whose business is primarily domestic and who have their hands full implementing ANSI X12 are less interested in EDIFACT. High interest of the standard is shown by large companies who are actively involved in international trade.

Vendors feel that users need help in two areas, education and implementation assistance. Education can best be provided by standards organizations, industry associations, and consulting companies; implementation assistance can be provided by vendors and user groups.

E**Likely Developments
in Networks**

As the research conducted for this study shows, there is a very low level of EDI usage in international trade, but it is growing rapidly, driven in part by the availability of international EDI network services. In addition to supporting on-network translation to EDIFACT for low volume customers (and in other circumstances) the networks generally have the ability to bill customers in a variety of ways, and in a variety of currencies.

While language is not an inhibiting factor in EDI-based trading (since the trading partners agree prior to initiating interchanges on the terminology and languages to be used), the newly emerging area of on-network machine language translation, currently being used to translate on line data bases from, for example, Japanese to English, may eventually be applied to EDI.

F**Likely Developments
in Software**

The more sophisticated EDI software packages already incorporate the ability to translate from flat files extracted from an application-related data base to EDIFACT, and back again. This capability runs in parallel with the ability to translate from flat files to ANSI X12 or TDCC, and back again.

What will *not* occur is the development of packages that can translate *between* the standards. There will always be an intermediate step to/from the flat file, with the EDIFACT or other standard “mapped” to that common file structure.

EDI software, particularly for mainframes, is being developed that incorporates sophisticated features relating to EDIFACT usage in several ways. For example, trading partner profiles contain information regarding what standard, and what version of the standard, each trading partner requires. The profiles also contain communications parameters that facilitate the interchange, be it direct, or through a third party network.

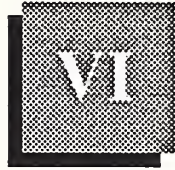
Updating EDI software to incorporate the latest standards versions can be accomplished by downloading the necessary tables into the software. This “teledelivery” of software is a viable alternative to diskette or computer tape distribution.

The next chapter examines the EDI standards being used outside North America, and looks at the prognosis for EDIFACT adoption worldwide.



EDI Standards Adoption Outside North America





EDI Standards Adoption Outside North America

How, and which EDI standards are being adopted outside North America is an important consideration for North American users who plan to apply EDI techniques to international trade. The requirements of trading partners are a primary factor in determining what standards are to be supported.

A

Europe

In one critical way, European companies have a more pressing need to adopt an international standard than North American companies. This need can be summarized as "1992".

According to the Single European Act of 1986, Europe will become "an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured." The purpose of the act is to remove the physical, technical and fiscal barriers to pan-European trade.

EDIFACT is being used by several European companies in anticipation of 1992. One industry-specific project is representative: Conseil Européen des Fédérations de l'Industrie Chimique (CEFIC). CEFIC is supported by the European Economic Commission to create pan-European EDIFACT-based usage of EDI. The pilot was interesting in that in addition to using EDIFACT, it uses the X.400 message handling system. It should be noted that the U.S chemical industry has implemented an X12 subset called Chemical Industry Data eXchange (CIDX). These two initiatives are expected to converge at some point in the future.

As indicated, European users have developed EDI standards for both domestic and international trade. Some of these standards are industry and country specific (such as VDA used by the West German auto industry). At this date, two European EDI standards stand out: TRADACOMS and ODETTE.

1. TRADACOMS

TRADACOMS is a domestic-only (United Kingdom) EDI standard developed by the Article Number Association. It is based on the international UN/GTDI syntax, earlier developed by the Simpler Trade Procedures Board. TRADACOMS has been in use since 1982 and has over 2,000 users at the end of 1989. There are no plans to merge this standard into EDIFACT. Rather, TRADACOMS representatives argue for a domestic standard, with EDIFACT for international trade.

Standards similar to TRADACOMS are SEDAS, used in Austria and Germany, GENCOD in France, Dakom in Sweden and TRANSCOM in Holland.

2. ODETTE (Organization for Data Exchange Through Telecommunications in Europe)

ODETTE is a pan-European EDI standard used by European automotive manufacturers, and is based on the UN/GTDI syntax. A French subset of the standard is called Galia. Because its activities are international in nature, ODETTE has adopted the EDIFACT syntax as the basis of its messages, making ODETTE convergent to EDIFACT. The ODETTE organization is actively working on the EDIFACT development process.

3. European Research Findings

Respondents to a survey conducted by the U.K.'s Department of Trade and Industry reported that after 1992, they intend to support EDIFACT, but over half also expect to continue using their current standards, specifically TRADACOMS.

Fifteen European EDI users, standards organizations and providers of software and EDI services were interviewed for this study.

While the small sample size does not provide statistically meaningful findings, the interviews do provide a representative view of European attitudes toward EDIFACT.

a. European User Survey

As with the North American user interviews, although most of the European companies interviewed are involved in international trade, only a few use EDI to support that trade.

European users receive their EDIFACT information mostly through EDI associations, and from their associates at other companies. They believe that a government agency, as well as industry and EDI associations, should be providing that information.

While users rated their interest in EDIFACT highly, they gave themselves mid-range ratings in terms of their EDIFACT understanding. They see the development of a global standard as highly important, sharing that view with their North American brethren. Despite the fact that there are some difficulties to be overcome in reaching this goal, European users uniformly believe the problems can be overcome, primarily because of the need to support international trade.

Users generally gave a low rating with regards to their interests adequately being represented in EDIFACT development. They also indicate that the current procedures for standard development need improvement, such as tighter project management, and more attention given to the practical rather than the theoretical. Only half of the user sample could correctly identify the sponsor of the EDIFACT standard as the United Nations.

These users generally feel a great sense of urgency in implementing EDIFACT, primarily because of European trading initiatives, and the requirements of their customers. This is in direct contrast to the North American survey findings which report little urgency. Curiously, European vendors assume users do not have an urgent need for EDIFACT.

Users gave generally low ratings to the EDIFACT issues they were asked to rate, but generally agree that people don't technically understand EDIFACT. They don't feel there's a shortage of EDIFACT software, but the lack of EDIFACT messages is seen as a significant impediment.

b. European Standards Agency Survey

Several European standards-making organizations were also questioned about EDIFACT. Generally, the organizations surveyed felt their interests were being represented in the standards development process. They currently receive their EDIFACT information directly from the EDIFACT organization, but feel the information should be provided by the European Commission and by government agencies.

c. European Vendor Survey

European vendors estimate that at this point, fewer than 50 companies are now using EDIFACT messages. With few exceptions, the software vendors' products do support EDIFACT, and most express strong corporate support for EDIFACT. One vendor said that they would offer EDIFACT only if required by their users.

In contrast with users' views, the European vendors rate customers' interest in EDIFACT at mid-range. They give low marks for their customers' understanding of EDIFACT. Their customers also have a very low understanding of the differences between ANSI X12 and EDIFACT,

something to be expected since few European companies need to know about the North American standard.

While the users' interviewed indicated a high urgency to adopt EDIFACT, the vendor community generally rated their customers' sense of urgency as low. This finding is possibly formulated based on customers' expressed needs for EDIFACT, but as noted, very few companies are now using EDIFACT. Rather, there is an expectation that EDIFACT will be adopted in the future.

The vendor community rated a list of EDIFACT concerns uniformly low, in part because the issues directly relate to their products and services, and so are really not "concerns" as such. A network company, for example, is unlikely to evaluate the concern "ability of the networks to handle EDIFACT" at a high rating.

Vendors believe that EDI associations, first and foremost, are the entities best positioned to provide the seminars and updates needed to help users understand and implement EDIFACT.

B

Japan

EDI is taking place in Japan, although it's somewhat different than that experienced in the U.S. Almost all Japanese supermarket and convenience store chains are using EDI. There is also growing usage elsewhere in the food industry, in sporting goods, and in auto supply. Japanese automakers are mostly using proprietary EDI to communicate with their domestic suppliers and international affiliates.

As with the U.S., the first issue on the minds of many Japanese IS executives is standards. Initially, this discussion centered on data communications standards associated with EDI transmissions. Now, format standards are the primary concern. The discussion is a relatively new one, rising as interest and awareness of EDI has increased.

The ANSI X12 and EDIFACT standards are virtually unused in Japan. Instead, a plethora of company specific formats are used between companies and their suppliers. For example, Toyota has been requiring its suppliers to use its own formats.

However, ANSI X12 is being used by at least one company. Seiko Epson's implementation called SEIGIS (for Seiko Epson Integrated Global Information System) handles EDI transactions between the company's headquarters and its overseas suppliers - in X12. The reason for this is that the company's world wide subsidiaries needed many different types of transactions that were not available in other standards. Although private formats were considered, a public format seemed better for long-term usage. The few existing Japanese EDI standards were

deemed limited for Seiko's needs. Further, because Seiko has trading partners all over the world, a global approach was needed and only ANSI X12 fit the companies' requirements.

1. Japanese Public EDI Standards: JCA, ZENGIN and EIAJ

There are several "public" Japanese EDI formats. The Japan Chainstore Association (JCA) standard and a banking format called ZENGIN (an acronym for the major Japanese banking association) are two of the best known. Although ZENGIN is primarily used for EFT between banks, it is being adapted for other transactions such as purchase orders. Both JCA and ZENGIN specify communications protocols (bisynch) and both use fixed length data fields. ANSI X12 and EDIFACT use the more efficient variable length field structure.

The large and influential Japanese electronics industry is using a variable length EDI format called EIAJ (Electronics Industry Association of Japan). This standard was developed to handle EDI transactions between manufacturers and component suppliers. Some of the major electronics manufacturers were requiring their suppliers to use their private networks and proprietary formats for EDI. The suppliers, trying to cope with multiple networks and formats, rebelled and started pressuring the manufacturers to interconnect their private VANs. Due to competitive concerns, the manufacturers refused. As a solution, IBM/Japan built an interfacing core network for all the private electronics manufacturers' networks to connect to, and also helped develop EIAJ formats.

2. Japanese Government Agency Involvement

U.S.-based EDIFACT delegations have found resistance to EDIFACT primarily because the standard is new and unproven. However, this hurdle is being overcome.

A Japanese government-sponsored steering committee within the Ministry of International Trade and Industry (MITI) is promoting EDI and serving as a forum for the creation of a cross-industry generic standard - a development effort that may take two more years to complete although some Japanese observers say that a Japanese Information Standard (JIS) for EDI could be proposed sooner, and that very likely, it will conform to ANSI X12 structures, and ideally also have compatibility with EDIFACT. It is also expected that the EDI JIS will have a Japanese flavor to adjust for unique business requirements.

3. Japanese Participation in EDI Standards Development

Japanese representatives from the Japan Information Processing Development Center (JIPDEC) and specifically experts from the Center for the Informatization of Industry within JIPDEC have been attending UN/

EDIFACT meetings. JIPDEC serves as a technical research resource for MITI. A North Pacific Rapporteur may be named by the trade facilitation organization, JASTPRO. JASTPRO has primarily been involved in disseminating trade facilitation information including EDI.

Other Japanese government agencies interested in EDI are the separate Ministries of Transportation and Finance and the Ministry of Public Telecommunications (MPT). MPT has been sponsoring EDI awareness programs and issuing informational materials.

The standards debate in Japan now centers on the question of EDIFACT's appropriate role in supporting Japanese import and export functions. Some industry representatives feel the domestic standard should be established first, with EDIFACT a secondary consideration. However, more than one interview subject indicated that Japanese industries tend to take a standard which is adopted by overseas industries, when they are certain those standards have "staying power."

One executive interviewed for this study described a scenario where a U.S.-based Japanese-owned automaker's MIS director adopts ANSI X12-based EDI due to the promotional and educational efforts of the Automotive Industry Action Group. Later, the company recognizes that some of the same systems can be used to exchange data with headquarters in Tokyo. Meanwhile, his Japanese counterpart is reluctant to adopt "true" standards-based EDI because of the large investment made in existing, albeit proprietary systems.

As in the U.S., there is little urgency felt in Japan in adopting EDIFACT. Accordingly, international EDI services and standards are expected to be pushed from the U.S. side. The more foreign subsidiaries become involved in EDI, the more Japanese companies will see the need.

C

Hong Kong

The trading island of Hong Kong is wrestling with how it will adopt EDI, with two projects underway. Because of its involvement in international trade, EDIFACT will be the chosen standard. Members of the Tradelink, a company formed by shipping, banking and government interests have developed an EDIFACT-based Certificate of Origin message that will be submitted for approval.

D

Singapore

As with Hong Kong, EDI in Singapore is being implemented in support of international trade. Initially, proprietary formats are being developed, however as EDIFACT UNSMs become available, they will be adopted. A Dutch dairy concern is using EDI to export products from Holland to Singapore, using the Port of Rotterdam's INTIS network for message transmission.

E**South Korea**

Pilot programs involving Korean manufacturers and North American customers in automaking and retail are using X12 formats to comply with customer requirements. In this case, the standard was supplied as part of the U.S.-based software vendor's solution. The Koreans' VAN company DACOM is handling the domestic side, while AT&T and its reseller Martin Marietta are carrying the international leg.

F**Australia and New Zealand**

EDI activity in these South Pacific commonwealth nations is just getting underway. Industries involved include automakers such as General Motors, Ford, Nissan, Toyota and Mitsubishi, plus automaker suppliers in steel and electronics. Other users are found in retailing, wholesaling, petroleum, pharmaceuticals and trade services. EDI/EFT services are also being launched in association with banks.

Domestic and international EDI traffic in the retail and automotive industries is almost exclusively using ANSI X12; however shipping interests that are currently introducing port automation systems are incorporating EDIFACT functions. The customs agencies in the respective countries are actively evaluating EDIFACT messages. Airline carrier Qantas has implemented an EDI messaging system based on EDIFACT.

G**Summation on International EDI Standards**

The availability of domestic North American and Pan-European standards, coupled with the controversy over EDIFACT means that despite high levels of interest by government agencies involved in international trade, and despite the support of multinational corporations who are testing EDIFACT transactions due to their unique business needs, EDIFACT will likely remain a standard used exclusively for international trade. However, there are exceptions: It has been reported that users in the nascent Italian EDI market are adopting EDIFACT for domestic trade use.

It is worth noting that countries now adopting EDI, particularly those in the Pacific Basin, have generally implemented X12 and TDCC formats because they offer a full set of most-needed transactions, and because there are currently few approved EDIFACT messages.

However, while embracing existing formats, users in these areas (such as Australia, New Zealand, Korea and Hong Kong) have signaled their intentions to adopt EDIFACT—when and if it is available for their needs.

The next chapter describes the process of standards interfusion, and examines what needs to happen for the dominant North American standard, ANSI X12, and EDIFACT to come together.



Commentary on Standards Convergence, Evaluating EDIFACT



Commentary on Standards Convergence, Evaluating EDIFACT

This chapter examines the political possibility of convergence between EDIFACT and other EDI standards, and evaluates the arguments for and against the adoption of EDIFACT as a universal standard. It is based on INPUT's judgment and was not a subject addressed in user or vendor interviews for this project.

A

Past EDI Standards Convergence

EDI standards have converged in the past. For example, the formats developed for the auto industry under the direction of the Automotive Industry Action Group (AIAG) have interfused with the generic ANSI X12 standards. Companies using proprietary formats are moving to support the ANSI X12 standards; an example is Sears.

There is evidence of other standards coming closer together. For example, the grocery industry's Uniform Communications Council serves as the secretariat for the X12-based Voluntary Inter-industry Communications Standards group which develops and maintains standards used in retailing and apparel. UCC members serve on the X12 Board of Directors. There have also been negotiations on a more direct affiliation between the UCC and the X12 organizations.

The migration of X12 to EDIFACT has been proposed and affirmatively voted. However, the technical and cultural issues which need to be addressed are non-trivial.

B

Migration of X12 to EDIFACT

The North American X12 organization is inherently domestic in its focus and constituency while EDIFACT is inherently international in its outlook. This means that EDIFACT will likely focus on those messages that are used in international trade. However, the intention is for EDIFACT UNSMs to be usable both domestically and internationally.

A migration from ANSI X12 to EDIFACT may take up to a decade. Rather, both sets of standards will develop in parallel in the interim. Companies and industry groups will choose between them based on their business needs, the requirements of their trading partners, the basic nature of their commerce, and the availability of suitable Transaction Sets/UNSMs.

As reported in Chapter IV, a point-by-point technical examination was made of EDIFACT and X12. Approximately 30 changes were proposed, nearly divided between the standards, in order for convergence to occur.

C

The EDIFACT Debate

Within North America, there have been heated discussions regarding the relative merits of ANSI X12 versus EDIFACT that go beyond the technical similarities and differences. Two general viewpoints are held:

- One view states “ANSI X12 now; EDIFACT in Five Years” implying that it will take that long for EDIFACT to develop a sufficient number of transaction sets to be useful for most users.
- The other view is more vocal: “X12 now, EDIFACT Never!”

There have been equally vocal concerns heard in Europe where a user base has adopted, and invested in, TRADACOMS and ODETTE standards.

D

Pros and Cons of EDIFACT

ANSI X12 has built upon previously existing standards (e.g. TDCC) and has a range of readily available transaction sets. Its procedures have been fine-tuned to be considerate of, and to take into account, industry needs. EDIFACT development and maintenance procedures differ from those used by ANSI, and this is causing confusion among users.

EDIFACT is very rich and adds more overhead to individual messages. However, companies testing EDIFACT (typically multinationals) say that the syntax and messages support complicated international trade procedures better than previously existing standards.

Some critics have argued that EDIFACT development is going too slowly; observers note however that the syntax received the fastest ISO approval of any submitted standard, and that within the context of international standards development, things are going rather rapidly.

Others have argued that EDIFACT development is going much too fast, and that their interests are not being represented. Supporters maintain that development is proceeding at its natural pace, and that while timing may be important (in part due to the anticipated 1992 creation of a unified European state), users' interests have been solicited and input is

being provided through the appropriate channels. If users feel their interests are not represented, it's their own fault; they were asked for their suggestions.

Due to a sensitivity to the "going too fast" issue, and also to address quality control concerns, the EDIFACT group has adopted a lengthier process for message approval. At the September 1989 meeting, procedures for version release were formalized in a directory, to keep message development uniform and consistent.

Some European supporters of EDIFACT have stated that Europeans are tired of seeing the U.S. rule the standards world. U.S. critics say that the Europeans are being uncooperative and vain in their attempts to push a European-derived standard on the rest of the world.

However, the findings of the survey conducted for this report paint another picture. When interviewed on the subject, the majority of respondents gave low points to the notion that EDIFACT implementation is being delayed because the standard is a European "invention" - in other words, "not invented here."

Supporters of ANSI X12 maintain that those promoting EDIFACT are attempting to reinvent the wheel; that X12 can serve international needs admirably and point to the adoption of X12 by several nations (Australia, Korea, others) as proof. ANSI X12 supporters say that some elements of their standard have been proven in actual use for over 15 years while EDIFACT offers a "promise" of a better system. Others believe that having two standards (ANSI 12 and EDIFACT, or TRADACOMS and EDIFACT) is better than having ten standards. They note that transportation-related interests (ports, carriers) are looking to base their EDI implementations on EDIFACT which is seen as truly international.

EDIFACT is viewed as advantageous to companies involved in international business; the proof of this is the adoption and participation in pilot testing by Dutch-based Phillips, U.K.-based ICI and U.S.-based Texas Instruments. EDIFACT's push, say the critics, is intended to put North American businesses at a disadvantage in the competitive international trade area. The opposing view reminds these critics that EDIFACT was intended as an international standard for all nations to use, with no malice of forethought.

Critics say that EDIFACT is not a "true" international standard since only Europe and North America are represented; pointedly missing from the deliberations are participants from the Pacific Rim, and specifically the Far East. However, Pacific Rim "observers" have attended meetings, and EDIFACT missions have been sent to the Far East to "spread the gospel" and recruit participation. Rapporteurs will be named soon.

Further confusing the picture is the fact that some European users have “jumped the gun” by creating new, but not formally adopted, messages based on the EDIFACT syntax. These messages are called EDIFACT compliant.

While some think the discussion, heated and otherwise, only makes “good press,” INPUT’s research has found users very confused about their investment in any EDI standard. While users may fear that an investment in either standard may be wasted if the other “wins” the debate, the true risk is immobilization—doing nothing, and thereby forgoing the benefits EDI can offer.

Different EDIFACT perspectives are summarized in Exhibit VII-1.

EXHIBIT VII-1

Different Perspectives on EDIFACT

Objections	Responses	Type of Issue
"If it isn't broken, don't fix it"	One global standard benefits everyone	Technical
Many available North American transactions	EDIFACT supports international trade better	Business
EDIFACT is "going too slow"	Received fast ISO approval	Political
"EDIFACT is going too fast"	North American user interests have been solicited	Functional
Europeans are being parochial	U.S. has dominated the standards world too long	Emotional
EDIFACT "reinvents the wheel"	EDIFACT is truly an international compromise	Political
EDIFACT intends to put North American trade at a disadvantage	EDIFACT removes electronic barriers to trade	Economic
EDIFACT is missing a Far East input—it is not international	Far East participation is actively being pursued	Political

E**EDIFACT User Experiences**

The results of the survey of EDIFACT users were reported in Chapter III. As can be expected, at this date, there are very few EDIFACT users.

Texas Instruments (TI) is taking an interesting approach to EDIFACT. The company is developing its own messages using the EDIFACT syntax, to be submitted later to the standards body for endorsement. The specific messages being developed are price catalog, inventory status, order book status and a resale application.

TI's approach to message development is aggressive. The company has adopted Status P messages (some of its own creation) prior to their being standardized, planning to cope with any changes in the final version of the standard as necessary.

TI also supports multiple message formats, using look-up tables associated with its mainframe EDI translator to determine what standards are being used by specific customers, and also to translate part numbers between their customer's records and TI's own numbering system.

TI is no renegade. It is participating in the European EDI Forum for Companies with Interests in Computing and Electronics (EDIFICE) program to create Pan-European standards for the electronics industry.

Texas Instruments has shown other support for EDIFACT beyond adopting the standard. The current vice chairman of the North American EDIFACT Board is from TI. The computer maker has donated some of its equipment to the EDIFACT organization to enable it to manage standards development.

F**What's Still Needed?**

Several requirements have been raised by those testing EDIFACT messages.

1. Electronic Negotiable Bill of Lading

In international trade, the negotiable Bill of Lading is a key instrument. EDIFACT does not have such a transaction in process or planned; rather, the International Forwarding and Transportation Message (IFTM) is intended to cover the Bill of Lading requirement along with several other transactions. The IFTM essentially serves as a blank sheet of paper on which a variety of data segments, properly identified, are entered. The needed data can then be extracted as appropriate.

However, the IFTM does not provide for an easy way to extract data for the Bill of Lading or an airway bill, according to users.

The negotiable Bill of Lading represents ownership of goods. The recipient of this document becomes the owner of record, and can resell the goods represented even before the shipment arrives at its destination.

The negotiable Bill of Lading is often sold several times before the final holder receives the actual shipment.

An Electronic Negotiable Bill of Lading is being proposed by the NCITD (International Trade Facilitation Council) to the UN/EDIFACT organization which makes a bank or other responsible party a central repository, holding fiduciary legal rights to a negotiable Bill of Lading on behalf of the actual owner. As each party in the transaction negotiates or sells its right to the shipment, that information is authenticated with the central party until the final holder receives the shipment.

2. Monetary Signs are Missing—But Not Needed

As noted in the comparison between X12 and EDIFACT, EDIFACT does not support the dollar sign (\$) or international monetary symbols. At first, this would seem a serious deficiency in a standard designed for international trade. But it is not. Rather, the convention used is a three letter code based on the standardized country code and a third letter describing the type of currency. For example, USD denotes U.S. Dollars.

3. EDIFACT Requirements of Users

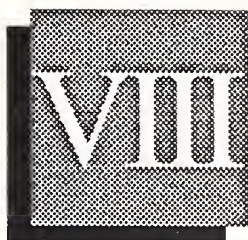
As with any process that requires adherence to standards, the initial data entry process that creates EDI transactions requires a certain amount of discipline. While someone using a paper document may inadvertently enter the date, for example, in the wrong place, a human interpreter can determine the intended meaning of the information.

However, with EDI, if a data segment is entered with the wrong codes, the transaction may be rejected as being non-compliant.

With EDIFACT, there are certain illegal characters that must be stripped from the data entry process. These include monetary signs.

Another need identified by EDIFACT users is the capability to broadcast EDIFACT messages to several addresses. This issue appears to be related to a planned application of the X.400 Message Handling System to EDI, and to the ability of third-party networks to provide broadcast or “carbon copy” message distribution as a value added service.

The next chapter presents recommendations for all interested parties, and concludes this report on EDIFACT.



Concluding Remarks



Concluding Remarks

A

Food for Thought for Users

For North American users involved purely in domestic trade, with no intentions of expanding their markets internationally or looking off-shore for sourcing, the approach to EDIFACT should be clear: it is unlikely it will impact their businesses for many years.

North American users involved in both domestic and international trade, in the short term, should plan to use both domestic (i.e. X12) and international (i.e. EDIFACT) standards. In practice, the domestic and foreign operations of companies tend to be separate, meaning different internal organizations will be responsible for standards support. However, it is desirable to integrate the information systems used by the domestic and foreign operations, meaning it will eventually be desirable to adopt one EDI standard to simplify this integration.

Users should participate as much as their resources permit them to in order to understand EDI standards, and influence them according to their industry's needs. Purely commercial and corporate interests should be set aside for the larger good.

Perhaps most importantly, users should recognize that the "standards controversy" is transient, and is an insufficient reason for temporizing or delaying an EDI implementation. Users should not let the varied state of EDI standards delay their implementation. Standards will continue to evolve and change; those waiting for things to "settle down" will miss opportunities to improve efficiencies in their trading relationships and in their related managed information flows.

B

Recommendations to Trade Associations

The various associations that deal with individual industries, and those that deal with a cross industry discipline such as EDI, have several opportunities to assist users in the realm of EDI standards.

- **Education and Training**—This is perhaps the most obvious area of opportunity. As shown in Exhibit VIII-1, users' preferred method for learning about EDIFACT is through educational seminars. Users expect, and want, EDI associations to be the provider of this information. These courses, in addition to educating users, should bring the EDI message to influential senior management.

EXHIBIT VIII-1

Help Needed in Understanding EDIFACT

- Educational seminars
- Implementation guides
- Documentation/technical information

- **General Business Awareness**—The biggest obstacle to adoption of EDI is not confusion over EDI standards, but a lack of understanding and appreciation of the technique itself. A public awareness and education campaign positioning EDI in terms of global competitiveness and productivity should be launched cooperatively by industry and the EDI associations.

C

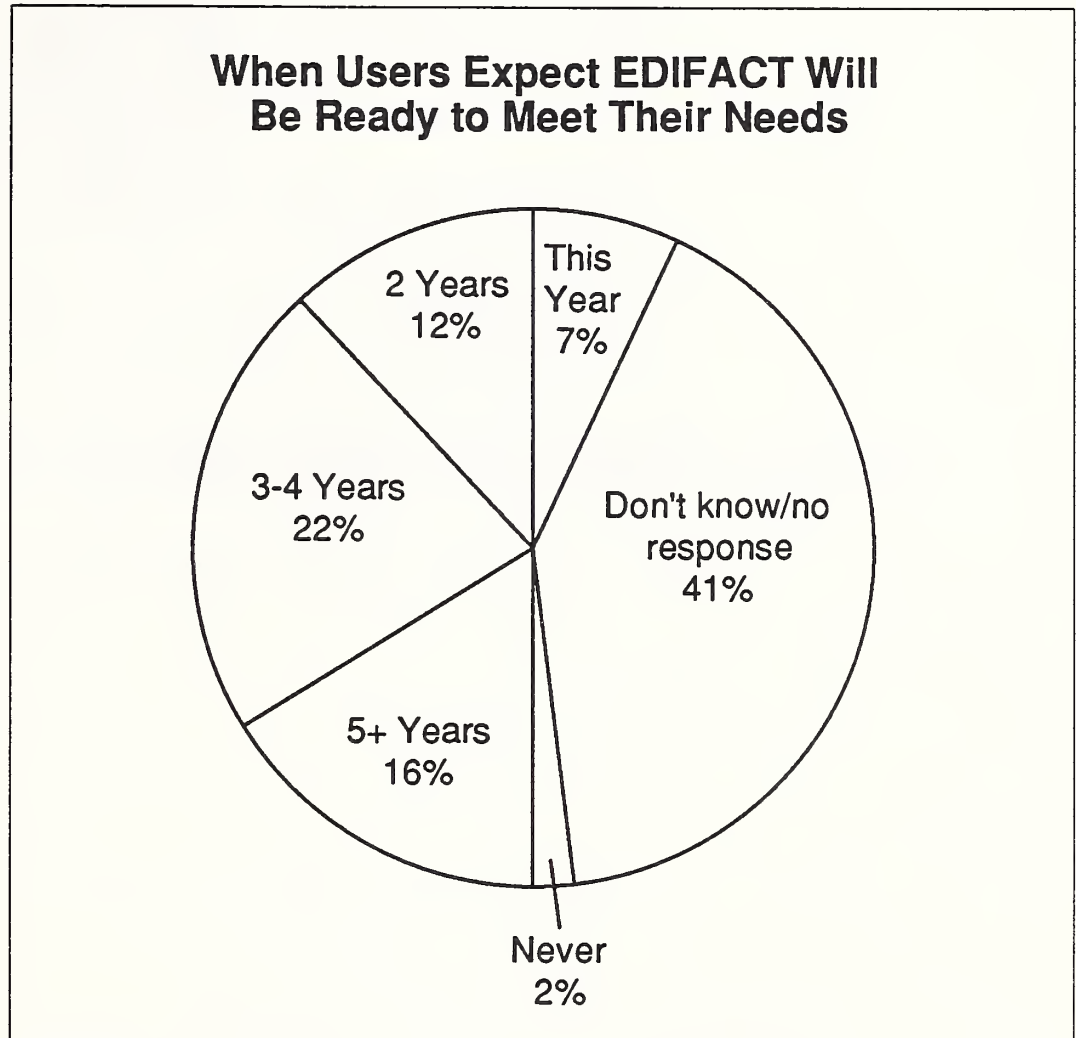
Open Issues

One of the EDI cliches is "It's not *if* you're going to adopt EDI; it's *when*." Exhibit VIII-2 shows that users expressing an opinion generally do not expect EDIFACT to be ready for their needs for at least three years.

However true the above cliché may be, there are several unresolved issues regarding EDI implementation that go beyond EDIFACT. Among these issues are:

- The economic impact of a business process that shortens the supply stream, reduces inventory and puts more intermediate materials in the pipeline. How does this effect transportation services? How does this effect smaller companies?
- The human issues that involve retraining and redeploying staff to adjust for "the new way of doing business." Where do the labor unions fit? What about ergonomic issues and job burnout issues? Are we replacing sweatshops with overheaded, computerized workstation cubicles?

EXHIBIT VIII-2



- The legal issues that relate to the basis of business relationships. Contracts, master agreements, liabilities, payment schedules, communications treaties and more are being rewritten. As the rules are changed, who benefits? Who loses?

Again, these are open issues that transcend the “EDI factor”, but often involve it.

The key remaining open issue specifically related to EDIFACT is this: *Can users get beyond the confusion and protracted discussion about EDI standards to see the benefits and act accordingly?* The answer, we believe, is affirmative. The method is through awareness and education.

D

A Final Thought: To the Nations of the EDI World

The standards making bodies in information systems and services generally are a potentially confusing group of overlapping organizations, arcane acronyms and differing procedures.

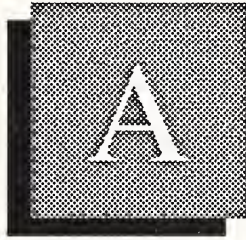
Even within one application area, such as EDI, there is an array of potentially confusing approaches to the uninitiated.

What is clear is that for most standards, and in particular, for EDI standards, even when the “debate” about EDIFACT or X12 is settled, the situation will not be “settled”; all EDI standards are subject to continual evolution as technical and business requirements evolve.

The administrative problems of keeping track of which trading partner or government agency requires which version of which standard will not prove to be overly burdensome. Indeed, companies today must keep track of different addresses, shipping methods preferred, different pricing lists for favored customers, etc.

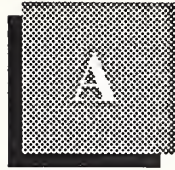
By examining the mysterious, the difficult to comprehend, and the technical, the “scare” evaporates. Users can take another step toward doing something that will benefit their companies.

It is hoped that this report has been a positive force in achieving that end.



Appendix: Trade Facilitation Organizations





Appendix: Trade Facilitation Organizations

EXHIBIT A-1

Trade Facilitation Organizations

COUNTRY	ORGANIZATION	ADDRESS/PHONE/TELEX
Afghanistan	Trade Facilitation Committee	Ministry of Commerce, Kabul
Australia	Trade Facilitation Committee	Australian High Commission, Canberra House, Maltravers Street, London WC2R 3EH, United Kingdom tel (44.1) 4388000
Austria	Trade Facilitation Committee	Bundeswirtschaftskammer, Stubering 12, Vienna, Austria tel (43.2) 2265050 telex 111871
Bangladesh	BANPRO	Export Promotion Bureau, Chamber Building, 122-124 Motijheel Commercial Ard, Dacca-2
Belgium	SIPROCOM	Office Belgie du Commerce Extérieur, World Trade Centre, Boulevard E Jacquain 162, B-1000 Brussels tel (32.2) 2194550 telex 21502
Bulgaria	Trade Facilitation Committee	12 Sofiiska Komuna, Sofia tel (350.2)882011, telex 22024
Costa Rica	CENPRO	Edificio Murray 4to piso, Apartado Postal 5413, San Jose de Costa Rica
Czechoslovakia	FITPRO	Czechoslovak Chamber of Commerce and Industry, Argentinska 38, 17005 Prague tel (42.2) 8424111, telex 121862

EXHIBIT A-2

Trade Facilitation Organizations

COUNTRY	ORGANIZATION	ADDRESS/PHONE/TELEX
Denmark	DANPRO	HC Andersens Boulevard 18, DK 1596 Copenhagen V tel (451) 152233, telex 22993
Dominican Republic	CEDOPEX	Centro Dominicano de Promoción de Exportaciones, Plaza de la Independencia, Santo Domingo
El Salvador	Trade Facilitation Committee	ISCE, Paseo General Escalón 4122, Apartado Postal (01) (19), San Salvador
Finland	FINPRO	Finnish Foreign Trade Association, Arkadigatan 4-6B, SF 00100 Helsinki 10
France	SIMPROFRANCE	61 rue de l'Arcade, 75008 Paris, France tel (33.1) 429 30 302, telex 640 795
Fed. Rep. Germany	DEUPRO	Bundesministerium für Wirtschaft, Postbox 140 260, 5300 Bonn1, West Germany tel (49.228) 6151, telex 886747
German Dem. Rep.	Trade Facilitation Committee	Unter den Linden 44-60, DDR-1080 Berlin
Guatemala	GUATEXPO	Centro Nacional de Promocion de las Exportaciones, Torre Professional, 6a Avenida 0-60 Zona 4, 5e nivel, Guatemala

EXHIBIT A-3

Trade Facilitation Organizations

COUNTRY	ORGANIZATION	ADDRESS/PHONE/TELEX
Honduras	Trade Facilitation Committee	Ministero de Economía, Tegucigalpa
Hungary	Trade Facilitation Committee	Ministry of Foreign Trade, Honved Utca 13-15, H-1880 Budapest V tel (361) 530000, telex 225578
Hong Kong	Trade Facilitation Committee	Trade Industry and Customs Department Ocean Centre 726, Canton Road, Kowloon, Hong Kong telex 45126
India	INDPRO	Indian Institute of Foreign Trade, Ashok Bhawan, 93 Nehru Place, New Delhi 110019, India tel (91.11) 655124
Ireland	EIRPRO	Irish Export Board, P.O. Box 4 Dublin 4, Rep. of Ireland tel (353.1) 695011, telex 93678
Italy	ITALPRO	Ministero delle Finanze, Direzione Generale, Studi della Legislazione Comparata e le Relazioni Internazionali, Piazza Marconi 25, 00144 Rome-EUR
Japan	JASTPRO	7th Floor, Daiichi Daimon Building Shiba Daimun 2-10-1 Minato-ku, Tokyo, Japan telex 222916
Kenya	KENPRO	Kenya External Trade Authority, P.O. Box 43137, Nairobi

EXHIBIT A-4

Trade Facilitation Organizations

COUNTRY	ORGANIZATION	ADDRESS/PHONE/TELEX
Republic of Korea	SITD	Administrative Improvement Commission Office of the Prime Minister, Room 503 Capitol Hall, Seoul, Republic of Korea tel (82.2) 7202081
The Netherlands	SITPRONETH	Nederlands Normalisatie-Instituut Postbus 5059 2600 GB Delft, The Netherlands tel (31.15) 611061, telex 38144
New Zealand	SIDAP	Customs Department, Head Office Investment House, Whitmore Street Wellington, New Zealand tel (64.4) 736009, telex 31213
Nigeria	NITPRO	Nigerian Export Promotion Council, PMB 12776, 103 Lewis Place, Lagos
Norway	NORPRO	Nordic Trade Procedures Committee, P.O. Box 2526 - Solli, N-Oslo 2, Norway tel (47.2) 314050, telex 78670
Panama	Trade Facilitation Committee	Directro General de Comercio Exterior Ministerio de Comercio e Industria Apartado Postal 9658, Panamá 4
Paraguay	CEPEX	Centro de Promoción de las Exportaciones, España 374 (CC 1772), Asunción

EXHIBIT A-5

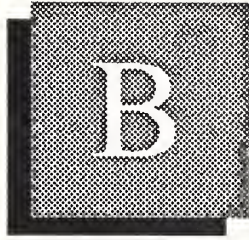
Trade Facilitation Organizations

COUNTRY	ORGANIZATION	ADDRESS/PHONE/TELEX
Philippines	PHILPRO	Philippine Export Council Buendia Avenue Extension Corner, Repose Street, Makati Metro Manila, Philippines
Poland	POLPRO	Polish Chamber of Commerce of Foreign Trade, Rue Trebacka 4 PL 002 81 Warsaw, Poland tel (48.22) 260221, telex 814361
Romania	Trade Facilitation Committee	Sous-comite pour la Normalisation des Documents du Commerce Extérieur Ministere du Commerce Extérieur, 14 Boulevard Republicii, Bucharest, Romania
Senegal	SENPRO	Centre Senegalais du Commerce Extérieur BP 8166, Dakar Yoff, Senegal telex 3286
South Africa	SITPROSA	Nedbank Central, P.O. Box 9039 Johannesburg 2000, South Africa tel (27.11) 3394041, telex 424111
Sweden	SWEPRO	P.O. Box 450, S-40127 Gothenburg, Sweden tel (46.31) 637277, telex 424111
Switzerland	SWISSPRO	61 Avenue de Cour, CH-1007, Lausanne

EXHIBIT A-6

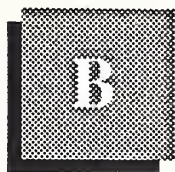
Trade Facilitation Organizations

COUNTRY	ORGANIZATION	ADDRESS/PHONE/TELEX
Turkey	Trade Facilitation Committee	Anlasmelar Genel Mudurlugu Ministry of Commerce, Milli Muhabir Unite, Ticaret Bankanligi, Ankara, Turkey telex 42204
United Kingdom	SITPRO	Almack House, 26/28 King Street London SW1Y 6QW, United Kingdom tel (44.1) 9300532, telex 919130
United States	NCITD	National Committee of International Trade Documentation, Suite 1200 350 Broadway New York City, NY 10013, USA tel (212) 925 1400
USSR	Trade Facilitation Committee	Management and Information Systems Department, Smolenskaya SQ 32, Moscow G-200
Zambia	Trade Facilitation Committee	Chamber of Commerce and Industry Lusaka



Appendix: EDIFACT Message Development Status Summary





Appendix: UN/EDIFACT Message Development Status Summary

Source: International programs Department of ASC X12 DISA; Secretariat to the North American Board.

Index:

- I. UNSM Development Status Codes
- II. Registered UNSM's (Status 2)
- III. Message Development Status Summary
- IV. Proposed UNSM's Under Review/Development (Grouped by functional areas)
- V. EDIFACT Change Requests

I. UNSM Status Codes for Documents Under Development:

- Status "O" Draft Document SO: A document under development and is submitted to WP.4 for information only. Status O is allocated the originating RT in accordance with its own internal procedures. Once a Status O has been allocated, the document must be submitted to WP.4 at its next session for the information of all delegations.
- Status "P" Draft Proposal SP: When all RTs formally agree that a document has reached a level of stability such that it can be considered by WP.4 as a draft for formal trial, the rapporteurs will assign a status P to the document and submit it to WP.4 at its next session with a recommendation for Status 1.
- Status "1" Draft for Formal Trial S1: Document has been approved by WP.4 for formal trial.EDIFACT
- Status "2" Recommendation S2: Document has been approved by WP.4 as a formal recommendation and in the case of messages is registered as a UNSM.

II Registered UNSM's - "2"

Commercial Invoice Message (Invoice) Trade/WP.4/R527/Rev.1 and Add.1 Function: A message claiming payment for goods or services supplied under conditions agreed between the seller and the buyer. (X12 equivalent: Transaction Set 810)

Available for distribution.

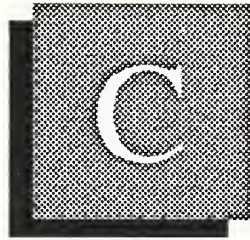
EDIFACT Message Development Status Summary

<u>UN/EDIFACT Messages</u>	<u>Log Number</u>	<u>Status</u>	<u>X12 EPP#</u>	<u>Functional Area</u>
INVOIC Commercial Invoice	WP.4/R.527	2		
ORDERS Purchase Order Message	WP.4/R.586	1	EPP-052	Purchasing
IFTMFR International Forwarding and Transport Message Framework 6 messages: - Provisional Booking - Booking Firm - Booking Confirmation - Shipping Instructions - Contract Status - B/L / Waybill - Arrival Notice	WP.4/R.592 Add.1 Corr.1	1	EPP-053 EPP-137 EPP-138 EPP-139 EPP-140 EPP-141 EPP-142	Transportation
CONTRL Acknowledgment/ Rejection Advice	WP.4/R.589	1	EPP-108	Syntax and Control
CUSDEC Customs Declaration Message	WP.4/R.590 Add.1 Corr.1	1	EPP-081	Government
CUSRES Customs Response Message	WP.4/R.591 Add.1	1	EPP-082	Government
QUALITY Quality Data Message	WP.4/R.583 Corr.1	1	EPP-112	Product Data
DESADV Despatch Advice Message	B-89-NM0001	0	EPP-055	Materials Mgt
DELFOR Delivery Instructions	WP.4/R.617	0	EPP-080	Materials Mgt
DELJIT Just-in-Time Message	WP.4/R.618	0		Materials Mgt
ORDRSP Purchase Order Response	WP.4/R.581	0	EPP-132	Purchasing
ORDCHG Purchase Order Change	WP.4/R.582	0	EPP-133	Purchasing
GENRAL General Message	WP.4/R.593	0	EPP-076	Product Data
CURRAC Current Account Message	WP.4/R.594 Corr.1	0	EPP-113	Finance

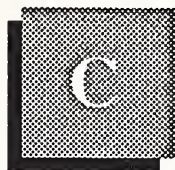
<u>UN/EDIFACT Messages</u>		<u>Log Number</u>	<u>Status</u>	<u>X12 EPP#</u>	<u>Functional Area</u>
REINAC	Reinsurance Account Message	WP.4/R.595 Corr.1	0	EPP-114	Finance
QUOTES	Quote	WP.4/R.622	0	EPP-135	Purchasing
REQOTE	Request for Quote	WP.4/R.623	0	EPP-136	Purchasing
REMADV	Remittance Advice	WP.4/R.621	0		Finance
PRICAT	Price Sales Catalog	WP.4/R.620	0	EPP-134	Purchasing
PARTIN	Party Information Report	WP4/R.619	0		Government
DIRSET	Directory Set for Status	WP.4/R.625 Add.1	0		
STATAC	Statement of Account	WO.4/R.624	0		
CREEXT	Extended Credit Advice	A-89-NM0005	Note #1		Finance
PAYEXT	Extended Payment Order	A-89-nm0006	Note #1		Finance
CREADV	Credit Advice	A-89-NM0007	Note #1		Finance
DEBADV	Debit Advice	A-89-NM0008	Note #1		Finance
PAYORD	- Payment Order	B-89-NM0005	Note #1		Finance
	- Receiving Advice	A-88-NM0001		EPP-073	Materials Mgt.
	- Non-Conformance	A-88-NM0005		EPP-109	Product Data
	- Request for Product Info	A-88-NM0006		EPP-111	Product Data
	- Product Specification	A-88-NM0007		EPP-110	Product Data
	- Change to Product Spec	A-88-NM0008			Product Data
	- Response to Specification or Specification Change	A-88-NM0009			Product Data
ORDSTA	Order Status Inquiry Message	A-88-NM0011		EPP-083	Materials Mgt.
ORDREP	Order Status Report Message	A-88-NM0012		EPP-084	Materials Mgt.
PROTRA	Product Transfer Resale	A-88-NM0013		EPP-085	Materials mgt.

<u>UN/EDIFACT Messages</u>	<u>Log Number</u>	<u>Status</u>	<u>X12 EPP#</u>	<u>Functional Area</u>
INVINQ	- Inventory Inquiry/ Advice Msg - Warranty Data - Regulatory Data	A-88-NM0014 A-88-NM0017 A-88-NM0016	EPP-086	Materials Mgt. Product Data Government
DIRDEF	EDIFACT Directory Definition	A-89-NM0004	EPP-131	Syntax & Control
EDIMAR	International Maritime Org Five Messages: - General Declaration - Ship's Store Declaration - Crew's Effects Declaration - Crew List - Passenger List	A-89-NM0009 WP.4/R.572 IMO FAL Form 1 IMO FAL Form 3 IMO FAL Form 4 IMO FAL Form 5 IMO FAL Form 6		Transportation
CEDEX	Freight Container Messages Nine Messages: - On-Hire Interchange - Off-Hire Interchange - Interchange - Damage Description - Work Estimate - Third Party Claim - Work Tender Request - Work Order - Work Cost Estimate Letter of Credit Financial Information Report	B-89-NM0009 ISO-TC104/ISO DIS 9897-3		Transportation Finance Finance
INVPRT	Stock Report/Distribution Report			
EURDEC	European Subsets including SAD, Simplified Procedures and specific national requirements			

Notes: 1. North American EDIFACT Board recommends submission for Status 0.



Appendix: EDIFACT, ANSI X12 Syntax Comparison



Appendix: EDIFACT, ANSI X12 Syntax Comparison

Document ASC X12C/89-211
Replaces: ASC X12C/TG6/88-297
ASC X12C/TG6/89-101
ABC X12C/TG6/88-041

Date: April 7, 1989

Reply To: Paul H. Moo
Price Waterhouse
16479 Dallas Parkway
Suite 810
Dallas, Texas 75248
U.S.A.
(214) 733-8211

Title: X12 - ISO 9735 Syntax Comparison and Recommendations

Contents

Item

Foreword
Character Sets
Control Characters
Data Elements
Segments
Transaction Sets/Messages
Functional Groups
Control Segments
Future Developments
Summary

A

Foreword

The following is a detailed, item by item, comparison of the syntax elements used in the ANSI ASC X12 electronic data interchange (EDI) standard, as specified in ASC X12.6, and the syntax defined by ISO 9735, Electronic Data Interchange for Administration, Commerce, and Transport (EDIFACT)—Application Level Syntax Rules. Each item appears under a general descriptive heading. The ANSI ASC X12 description of the syntax item appears first, designated as X12:, followed by the ISO 9735 usage of the same item under ISO: A discussion of the differences between the two syntaxes, listed under DIF:, appears next followed by known impacts to X12 installations under IMP. A recommendation to X12 on a migration path follows as REC. It is anticipated that each recommendation will be implemented through the X12 data maintenance procedure. Last, a section headed TAG: is included when a change is to be sought to the ISO 9735 standard through the Technical Advisory Group representing U.S. interests on ISO Technical Committee 154 (ISO/TC 154) and the North American rapporteur to the United Nations Working Party 4 (UN/WP4).

Use of the X12 standard in international trade will require modifications to the X12 syntax and the ISO 9735 syntax. Use of Universal Standard Messages (UNSM) in domestic trade will be the added benefit of the same modifications to both syntaxes. Neither syntax is, or should be, immune from some minor alterations to accommodate development of a fully functioning set of international transaction sets/messages.

Task Group 6 of ASC X12C is providing this discussion and technical review paper as a tool to be used by the X12 community, in conjunction with the International Project Team, North American UN/WP4 rapporteur, and TAG 154, to state a unified position on syntax. It is the considered opinion of the Task Group that a single international syntax, capable of supporting contributing national standards, is an achievable goal. Sectarian, parochial interests should not be made a part of X12's deliberations on this matter. The installed base of current X12 users must, of course, be taken into consideration. Migration to a consolidated syntax should allow for those who are already using existing transaction needs to give way to a spirit of mutual compromise and mutual benefit in discerning the most useful combined syntax. The objectives of the EDI user community must be met on a worldwide basis. Such is the intended purpose of this analysis and these recommendations.

B

Character Sets

X12: The basic X12 character set is the combination of all upper case letters, numerals 0 through 9, the space, and special characters ! @ # & ') * + , - . / : ; ? = (

The extended character set includes all of the above plus lower case letters and special characters > % \$ @ [_ { } \ < |

No encoding scheme is recommended for these characters and no default sort sequence is defined. These items are left to the trading partners for agreement.

ISO: The basic ISO character set is defined at two levels, Level A is composed of all upper case letters, numerals 0 through 9, the space, and special characters . , - =) / (' + : ? ! " % ? * ; < &

Level B contains all of the above characters plus all lower case letters and control characters.

ISO assumes a default encoding scheme of ISO alphabet 646 which is a 7 bit ASCII representation of each character. The 8 bit alphabets, ISO 6937 and 8859, can be used through a specific trading partner agreement, as can any other agreed method.

- DIF:** The X12 character sets contain characters not found in the ISO character sets. The basic character set contains the “#” sign which has no ISO counterpart. The extended character set for X12 adds the “\$”, “@”, “]”, “[“, “{“, “}”, “\”, “_”, and “|” symbols which do not exist in the ISO sets. X12 establishes no default bit encoding scheme for the character sets while ISO does set a standard which can be negotiated to another definition.
- IMP:** The difference between the two standards precludes the international transmission of national characters; i.e., the dollar sign “\$”. Use of the current X123 character sets in the international arena would require a UNA segment to provide the proper bit encoding for data element separators and segment terminators. A receiver of ISO documents will be required to understand the ISO ASCII alphabets defined as minimums.
- REC:** Add ISO 9735 Sections 4 and 5 to ANSI X12.6 as the minimum character sets for X12 transactions. In the absence of any partnership agreement, ISO alphabet 646 becomes the default. The international transmission of X12 transaction sets in a UNB/UNZ envelope, using the current X12.6 character set definition, will be made possible by adopting two default character set levels for ANSI X12 usage similar to the ISO defined UNOA and UNOB levels described above. This would require the recommended identifier “ANSA” or “ANSB” in the first 4 bytes of the syntax identifier field of the UNB segment, UNBO1, and eliminate the need for a UNA segment unless the sender deviates from the default values. The two syntax levels are:

Character(s)	ANSA	ANSB
Upper Case Alpha	X	X
Lower Case Alpha		X
Digits	X	X
Space	X	X
Exclamation !	X	X
Double Quotation “	X	X
Ampersand &	X	X
Apostrophe ‘	X	X
Left Parenthesis (X	X
Right Parenthesis)	X	X
Plus +	X	X
Comma ,	X	X
Minus/Hyphen -	X	X
Period .	X	X
Slash /	X	X
Colon :	X	X
Semi-colon ;	X	X
Question ?	X	X
Equal =	X	X
Asterisk *		X
Tilde ~		X

Character(s)		ANSA	ANSB
Percent	%		X
Commercial At	@		X
Left Square Brace	[X
Right Square Brace]		X
Underline	_		X
Left Brace	{		X
Right Brace	}		X
Oblique Slash	\		X
Vertical Bar			X
Less Than	<		X
Greater Than	>		X

Control Characters

Segment Terminator	Tilde	~	IS4 X'1C'
Data Element Separator	Asterisk	*	SI X'OF'
Component Data			
Element Separator	Vertical Bar		SO X'OE'
Decimal Mark	Period	.	Period .
Release	Not Used (Space)		Not Used (Space)

It should be noted that these character sets do not include the dollar sign (\$) or pound (#). These characters should be placed in a separate section of the X12.6 extended character set defined as national characters and should not be used in international transmissions except by prior agreement. The BNF for these characters may be represented in X12.6 as:

<national_character> ::~"\$" "#"

TAG: Change ISO 9735 Section 5.1 "Reserved for use as:" sentence to:

The following characters continue to participate in the defined character set but are reserved for use as:

Apostrophe	'	segment terminator
Plus sign	+	segment tag and data element separator
Colon	:	component data element separator
Question Mark	?	release character
Comma	,	decimal mark

Request a change to the sentence under ISO 9735 5.1 which reads:

? immediately preceding one of the characters ' + : ? restores their normal meaning, e.g. 10?+10=20 means 10+10=20. Question mark is represented by ??.

To read:

The release character immediately preceding one of the characters defined as a segment terminator, segment tag and data element separator, component data element separator, or release character restores the character's normal meaning., e.g., using the Level A syntax default set of reserved characters, 10?+10=20 means 10+10=20. A true question mark would be expressed as ?. The occurrence of a release character at any other position will be acted upon as though the ensuing character were one of the above named characters, e.g., A?B under syntax Level A would yield AB

C

Control Characters

X12: Three control characters are defined for X12 use. The segment terminator is used to identify the end of a segment. Data within a segment is delimited by data element separators which precede each data value and sub-element separators which follow a logical subdivision of a data element field. While provided for by the syntax, X12 has never defined a data element which requires the sub-element separator or defined the syntax rules to be applied to such a structure.

X12 provides no default values for these control characters and relies on the trading partners to supply this information to each other in the interchange control header.

ISO: ISO defines five control characters and provides a potential for six; the sixth being currently undefined. The segment terminator, data element separator, and sub-element separator are provided. The sub-element separator being designated the component data element separator. Additionally, ISO provides a decimal notation character and a release character. The decimal notation is typically a comma or period. The release character allows any of the defined control characters to resume its original semantic function for a single occurrence of the character. Release characters are common in data transfer protocols.

ISO provides a default value for each of these control characters in the Level A syntax. In Level B syntax, the release character is not needed and, therefore, not defined. A special segment, the service string advice (UNA), is used to assign alternate values to these codes.

DIF: The ISO use of two additional control characters and the concept of default values for all of the control characters are not within the current X12 syntax. The existence of default values requires a mechanism for changing the defaults but provides for a valid set of control characters to be assumed by the trading partners. The decimal notation control is reflective of the cross-border nature of the international standard. The release indicator allows a character to appear as both a control character and an element value under the graphic Level A character set. As noted above, the concept of composite data elements and the ancillary need for a sub-element separator is recognized by unused in X12.

IMP: In the absence of a UNA segment, the receiver of an ISO interchange has two possible default sets of control characters. Level A or Level B syntax is to be defined by the first data element in the UNB segment, the syntax identified. The format of the UNB would then be: UNB+UNO?. The plus sign is used to mark the position of the data element separator and the question mark indicates the position of the syntax level indicator. This means an element

separator must be processed before the syntax level, which identifies it as an element separator, has been defined. The assumption, of course, is that the positions up to the question mark are fixed by nature of the UNB's definition and the syntax level can be determined without reference to a data element separator. The parsing inconsistency, however, is noted.

Placing an X12 transaction set in an ISO envelope presents some problems in relation to the default control characters. Care is required in the use of text within any segment. A text string ending with a question mark would cause an ISO parser to discard the question mark as a release character and accept the character as part of the current data element's value. Since question marks typically appear at the end of sentences, this presents the likely occurrence of having the segment terminator accepted as a byte of data and running two segments together. Likewise a colon in a text string could be viewed by an ISO parser as an attempt to use a component data element separator where none is allowed.

Level B syntax adds a problem for users of IBM's 3780 bisynchronous communication protocol. The default value for the data element separator is IS 3, hex value 'ID'. This same character is used by the 3780 protocol for data compression. The use of the Level B syntax would require 3780 users to enter transparent mode.

Receiving ISO envelopes containing UNSMs will require the ability to recognize and parse all ISO defined control characters.

While the UNA and UNB segments may be successfully used to place an X12 transaction set within an ISO envelope unchanged, the converse may not be true. Only UNSMs which do not rely on the composite data element construct, do not use the release character concept, and use periods for decimal notation, could be placed in an X12 ISA envelope for transmission. The restriction on the use of the composite data element structure is based on accepted practice rather than actual syntax. The UNSM sender may place the composite element separator in the sub-element separator field provided in the ISA segment, but most, if not all, current parsers would not be capable of using it.

REC: Use the UNA segment to define the composite element separator as any unused character, the decimal notation as a period, and suppress the release character with the use of a space; or, accept one of the ANS default character sets defined in the character set section of this paper. This permits X12 documents to be sent without modification. As noted above, the syntax identifier in the UNB segment would be given the value ANSA or ANSB, American National Standard Level A or B syntax. This would effectively make X12 an ISO sub-set.

D

Data Elements

X12: An X12 data element is, by definition in X12.6, a single value or a set of related values. The second case calls for the use of the sub-element separator to segregate the values. As previously noted, although allowed in theory, this composite construct is not currently used in X12. The actual practice is to treat the qualifiers and data element values as individual data elements using data element requirement designator C, conditional, which notes the existence of a relationship to some other data element within the same segment.

X12 defines 6 specific data element constructs. These are real decimal, implied decimal, identifier, strong, date, and time. Each of these have syntax rules to be applied. Date and time are defined as unsigned integer values with the form YYMMDD and HHMM respectively. Time may alternately be expanded to greater precision by adding two digits after MM to represent seconds and following this SS value by a decimal notation and decimal fractions of seconds. The string field is simply a group of characters from the character sets defined above. Identifier refers to a value drawn from a predefined list maintained by X12 or a competent body recognized by X12. Numeric fields, both real and implied decimal, are composed of a series of digits which may be preceded by a sign character. An implied decimal element is assumed to contain a specific number of decimal places to the right of the decimal. A real decimal element will actually contain a decimal notation character at the location intended by the element's creator. The size of each element will actually contain a decimal notation character at the location intended by the element's creator. The size of each element is defined by a minimum and maximum number of bytes which may be included in the data element. An element of fixed length will have equal minimum and maximum values.

- ISO: The ISO syntax defines three data element types. These are alphabetic, numeric, and alpha-numeric. alphabetic elements may contain only the space character, letters, and/or alphabetic punctuation characters. Numeric elements may contain only digits, a leading minus sign, and/or a decimal mark. Alpha-numeric data elements may contain any characters from the specified character set. ISO data elements are either simple, a single value per element, or composite, multiple distinct related values within a single element. The concept of a generic value linked to a qualifier is included in the composite data element format, but the format extends to other data relationships as well. An ISO data element is defined as having either a fixed length or a variable length. Variable length data elements are defined by the maximum number of characters which may appear in the element. A minimum length of 1 character is assumed for variable length data elements.
- DIF: The use of composite data elements in the ISO standard appears, at first, as a major difference in the way the two syntaxes are being applied. While both provide for a sub-element/component separator, ISO is the only current user of the facility. In practice, the data element description method used by ISO is the equivalent of the X12 data element dictionary. The composite element identifier is a three digit reference number preceded by an "S" for service segments or a "C" for data segments. Each sub-element/component is identified with a four digit reference number which is also the identification method for simple data elements. Each composite element is defined in terms of a group of simple data elements. The syntax difference arises from the positioning of the data element separator in relation to the data it delimits and the sub-element/component separator's relationship to the values it identifies. A data element separator precedes the data element delimited while a sub-element/component separator trails all elements with which it is associated, except the last. The last sub-element/component element is terminated by the data element separator preceding the next data element or composite data element, or the segment terminator. The procedure for detecting a missing data element or composite data element is, therefore, different from the procedure for detecting a missing sub-element or component data element. A sub-element or component data element, however, remains the smallest unit of information. The composite data element is, as noted, a structure as opposed to a true data element as defined by both X12.6 and ISO 9735.

ISO's description of the numeric field is equivalent to the X12 real decimal field except for the stricture that the leading sign character can only be a minus sign since a positive value is assumed. ISO specifically prohibits the use of triad separators. No such prohibition appears in X12, but practice has assumed that such characters are not to be used and the BNF does not allow it. ISO requires a leading zero in a numeric field when the value is a decimal fraction, i.e., .5 is expressed as 0.5 in ISO. Finally ISO does not allow for the definition of variable length data elements which have a minimum length other than 1.

IMP: Few X12 data elements can be syntax checked in the ISO environment with the exception of R type elements. Date and time elements will not be subject to a date/time validation process by the receiver since they will be viewed as numeric. ID elements will be treated as alpha-numeric without any validation against authorized code lists. No elements will be received as integers in all cases. Data elements with variable lengths cannot be verified for a minimum length greater than 1.

The exclusive use of non-composite data elements does not create a conflict with the ISO standard. X12 becomes an effective sub-set in this regard.

REC: X12 should be investigating the use of the sub-element separator. The syntax provides for such a construct and its availability might be helpful in reducing the number of syntax notes used to define relationships between data elements in segments. X12.6 should be amended to provide specific syntax rules for the use of sub-element separators and the structures produced by their use.

X12.6 should be changed to specify that only a leading minus sign should be used in numeric elements, that all unsigned numeric elements will be assumed positive, and that triad separators are not permitted.

X12.3, Section 3.2, Data Element Reference Number should be amended to state the size of the reference number as 4 characters. Simple data elements will have a 4 digit reference number and composite data structures will use the ISO designation of a leading "S" or "C" followed by 3 digits for service/control segments and data segments respectively.

X12.6 should be amended to eliminate the use of non-integer Nn data elements. The need for a numeric integer remains and may be satisfied by the NO structure. Most other Nn requirements are for currency fields and a fixed two character-representation of fractional currency fails in an international arena. Such data elements may be either changed to R or given a special designation, such as North American currency, which will be phased out over time.

The X12.6 BNF defining the time data element should be amended to remove the use of the decimal mark as a precursor to decimal fractions of seconds. The precision to which a time may be expressed will be defined by the length of the data element with a type code of TM. Time data elements should have a length of either 4 (HHMM), 6 (HHMMSS), or greater than 6 (HHMMSSd..d), with the number of positions greater than 6 indicating the decimal precision of fractional seconds.

TAG: Delete ISO 9735 Section 7, Paragraph 2. Change ISO 9735 Section 10, Sub-Section 10.1 Paragraph 4 to read:

When a decimal mark is transmitted, there shall be at least one significant digit after the decimal mark. For values represented by integers only, neither decimal mark nor decimal zeroes are used unless there is a need to indicate a degree of precision. The number of zeroes following the decimal mark will indicate the degree of precision expressed by the data elements creator.

Delete ISO 9735 Section 10, Sub-Section 10.1, Paragraph 5 which details an example of the restriction being removed.

ASC X12 sees the required use of a zero preceding a decimal mark in the expression of a decimal fraction as a non-significant digit required only from a stand point of human readability. The development of EDI standards should be based on electronic, not human, capabilities.

Change Annex B, Service Segments Specifications and related entries in ISO 7372 Trade Data Elements Directory and ECE Message Design Guidelines, under Legend, Repr. which reads:

Repr.	Data value representation
a	alphabetic characters
n	numeric characters
an	alpha-numeric characters
a3	3 alphabetic characters, fixed length
n3	3 numeric characters, fixed length
an3	3 alpha-numeric characters, fixed length
a..3	up to 3 alphabetic characters
n..3	up to 3 numeric characters
an..3	up to 3 alpha-numeric characters

To read:

Repr.	Data value representation:
a	alphabetic characters
	- The characters A through Z and the space character; a through z may be used with Level B syntax or by IA.
n	numeric character
	- The digits 0 through 9, a leading minus sign and the decimal mark may be used.
an	alpha-numeric characters
	- Any character defined as belonging to the character set defined by the syntax level or by IA.
dt	date
	- 6 digits in the form YYMMDD. Values for YY may range from 00 to 99. Values for MM may range from 01 to 12. Values for DD may range from 01 to 31.

- tm time
- A numeric representation of time of day which may contain numeric characters. Time is expressed as HHMM, HHMMSS, or HHMMSSd..d based on the need for precision. Values for HH may range from 00 to 59. Fractions of a second may also be expressed using any digit from 0 through 9.
- i integer
- Digits 0 through 9 and a leading minus sign may appear.
- id identifier
- An alpha-numeric code drawn from a predefined list of authorized codes. Code lists may be supplied by any recognized standards body, governmental agency, or industry association.
- a3 3 alphabetic characters, fixed length
- n3 3 numeric characters, fixed length
- an3 3 alpha-numeric characters, fixed length
- dt 6 numeric characters, fixed length, YYMMDD
- tm4 4 numeric characters, fixed length, HHMM
- i4 4 numeric characters, fixed length
- id3 3 alpha-numeric characters, fixed length
- al..3 1 to 3 alphabetic characters
- nl..3 1 to 3 numeric characters
- an3..5 3 to 5 alpha-numeric characters
- i4..6 4 to 6 numeric characters, integer value
- idl..3 1 to 3 alpha-numeric characters

E

Segments

X12: An X12 segment is defined as a segment identifier, which is a label composed of 2 or 3 digits and/or upper case letters, followed by one or more data elements which are related in some manner. The segment ends with a segment terminator character. The segment terminator character and the data element separator are both described under control characters. The number of data elements allowed to appear is fixed by the segment's definition, but may vary in use, based on each data element's requirement designator.

Each data element is designated in the segment's definition as being mandatory, optional, or conditional. A mandatory data element must appear whenever the segment appears. An optional data element appears in the segment at the discretion of the segment's creator. A data element defined as conditional appears in the segment based on another data element's presence or absence in the same segment.

If an optional or conditional data element is omitted from a segment its position is occupied by the data element separator which would precede it. At any point, when all remaining data elements in a segment are either optional or conditional and will not appear during the current occurrence of the segment, the segment terminator character may appear after the final data element value which does occur.

ISO: An ISO segment begins with a segment tag which is a composite data element containing a code identifying the segment, followed by an optional component data element separator and a representation of the segment's nesting level and/or repeat count. The segment tag is followed by one or more data elements which are related in some manner. The segment ends with a segment terminator character.

Each element may be either simple or composite and each is preceded by a data element separator. Each component data element contained in a composite data element is followed by a component data element separator, except for the final component data element which is followed by the data element separator for the next data element or the segment terminator.

The number of data elements allowed to appear is fixed by the segment's definition, but may vary in use, based on each data element's requirement designator. Each data element is designated in the segment's definition as being mandatory or conditional. A mandatory data element must appear whenever the segment appears. A conditional data element appears in the segment at the discretion of the segment's creator.

The number of component data elements allowed to appear in a composite data element is also fixed by the composite element's definition. The occurrence of specific component data elements in the occurrence of a composite data element is, likewise, controlled by the mandatory and conditional designation appearing in the definition of the composite data element. A mandatory component data element must appear if the composite data element, of which it is a part, appears. A conditional component data element appears in a composite data element at the discretion of the segment's creator.

If a conditional data element is omitted from a segment its position is occupied by the data element separator which would precede it. At any point, when all remaining data elements in a segment are conditional and will not appear during the current occurrence of the segment, the segment terminator character may appear after the final data element value which does occur.

DIF: Segment identifiers in X12 are considered labels and act only to identify the segment being acted upon. ISO segment tags are data elements which contain a code, equivalent to an X12 identifier, and an optional nesting/looping construct. These component data elements are a part of the segment's identification and place the segment in a hierarchical position within a nested structure or both. No explicit means exists in X12 to identify a segment's hierarchical position or occurrence number other than transaction set definition, and the exchange of the transaction set between trading partners.

The ISO designation of a data element as conditional is the X12 equivalent of optional. The X12 designation of conditional has no ISO counterpart. ISO 9735 does not recognize data elements within segments being dependent on other data elements within the segment. Most of the X12 required conditional relationships are encompassed in the ISO use of composite data elements. Those X12 relationships which cannot be expressed in terms of composite data elements are not expressible under ISO and UNSM.

IMP: The way data elements within segments are construed by the two syntaxes is currently dissimilar in regard to composite data elements in ISO and conditionally related elements in X12. Neither syntax is capable of comprehending the other in these areas. An ISO parser would be able to properly locate the data elements within an X12 segment but would be unable to relate specific data elements to each other in a syntax check of their X12 defined conditionality. An X12 parser would, as stated earlier, not be able to comprehend the relationships inherent in the ISO composite data element construct. The component data element values and intervening component data element separators would probably be grouped by the parser into a single value until the next data element separator or segment terminator was encountered. A partial solution to these two data conditions would be to require adjacency of all data elements defined in X12 as related. Such a solution is, however, somewhat Draconian.

While the ISO permitted method of explicit nesting and looping, which employs the component data element portion of the segment tag, has yet to be used in any UNSM, its employment would render an X12 parser helpless.

One additional point is that a conflict already exists in X12.22, the Data Segment Directory, which defines the UNT, unit detail segment. ISO 9735 reserves all UNx segment names for ISO service segments and the UNT is specifically defined as the message trailer segment.

REC: As noted earlier, X12 should provide for the use of composite data structures and the syntax definitions associated with them as specified in ISO 9735. X12.6 should be amended with a clear and descriptive section on the construction and use of composite data structures. The ISO convention of assigning a data element identifier to both the composite data element and each of the component data elements should be adopted.

X12 must define a syntactically sound method for describing data element relationships which are already existing or not covered by the composite data element construct. Once X12 has identified and adopted such a codified method of describing data element relationships, a formal request to TAG 1564 and UN/WP4 should be submitted to add the same capability to ISO 9735. No such request for ISO to modify the existing international syntax should be considered until X12 has a clear and workable solution which relies on absolute syntax notation which is not subject to multiple interpretations. Such a codification is being prepared by ANSI ASC X12C Task Group 4 and will be presented to full X12 as part of the X12.6 editing project. Additionally, any X12 conditional relationship based on the semantic value of any data element should be removed. Such application related items should not carry the weight of syntax.

X12 should rename segment UNT to avoid any potential future conflict with ISO service segment definitions. Additionally, the X12.6 document should be amended to preclude any new segments from being given the characters UN as the first two positions of the segment identifier label. Consideration should be given to reserving a similar set of segment identifier labels for X12 control segment use.

TAG: ISO 9735 should be amended to state that a segment begins with a segment identifier which is a label composed of from 2 to 3 characters. Each character may be an upper case letter or a digit. This definition eliminates the explicit nesting and looping construct. Good transaction set design will allow the users to express nested and repeating structures without reliance on

this type of explicit notation. No current UNSM, extant or proposed, has used this construct and its elimination should be requested before any implementation of the technique would make its removal difficult or impossible.

Replace Annex A, A.37 with the following:

A.37 segment: A predefined and identified set of functionally related data element values which are identified by their sequential positions within the set. A segment starts with a segment identifier and ends with a segment terminator. It can be a service segment or a user data segment.

Replace Annex A, A.38 with the following:

A.38 segment identifier: A unique identifier which names a segment as specified in the segment directory. A segment identifier is composed of from 2 to 3 characters. Each character may be a digit or an upper case letter.

Remove Annex A, A.39

Change all ISO 9735 references from segment tag to segment identifier.

F

Transaction Sets/ Messages

X12: An X12 transaction set is composed of a transaction set header and trailer, a beginning segment, and one or more data segments. Data segments appear in a defined ordinal sequence and may not appear in any other sequence than that specified in the transaction set definition. Each segment is designated as either mandatory, optional, or floating within the context of the transaction set's definition. A mandatory segment must appear in its defined ordinal position, an optional segment may appear or be omitted at the discretion of the transaction set creator, and a floating segment may appear at any point within the transaction set at the creator's discretion. An optional segment, having all data elements defined as optional, shall not appear unless one of its data elements appears.

Individual segments may be repeated in their ordinal position if permitted by the transaction set definition. An ordered group of segments within a transaction set, called a loop, may also repeat at its ordinal position within the defined set. Segments or loops which repeat in this manner have a defined maximum number of allowed repeats. A segment group which repeats may not begin with a segment which is allowed to repeat. The segment group's requirement designation may be either mandatory or optional and is defined by the requirement designator of the loop's first segment.

A segment group which repeats may contain a segment group which repeats. This condition is referred to as "nesting." More than one segment group may not begin on the same segment, but more than one segment group may end on the same segment.

If a loop contains a segment which is also used at a later ordinal position in the same transaction set, an intervening mandatory segment must appear or, the transaction set design must

create a definable boundary for the segment group. This bounded loop requires the use of the loop start (LS) and loop end (LE) segments to delineate the boundaries of the loop.

An X12 transaction set is identified by a 3 character identifier which appears in the transaction set header record.

ISO: An ISO message is composed of a message header and trailer and one or more data segments. Data segments appear in a defined ordinal sequence and may not appear in any other sequence than that specified in the message definition. Each segment is designated as either mandatory or conditional within the context of the message's definition. A mandatory segment must appear in its defined ordinal position. A conditional segment may appear or be omitted at the discretion of the message creator. A conditional segment, having all data elements defined conditional, shall not appear unless one of its data element appears.

Individual segments may be repeated in their ordinal position if permitted by the message definition. An ordered group of segments within a message may also repeat at the group's ordinal position within the defined set. Segments or segment groups which repeat in this manner have a defined maximum number of allowed repeats. The segment group's requirement designation may be either mandatory or conditional and is defined by the message design.

A segment group which repeats may contain a segment group which repeats. This condition is referred to as "nesting." More than one segment group may not begin on the same segment, but more than one segment group may end on the same segment.

Two methods of indicating repeating segments and nesting exist in ISO. Implicit use of the ordinal positions of the message segments and explicit designation of the segment's position within the message. Explicit indication of where the segment falls with the message hierarchy is specified in the segment tag, the user may specify the hierarchical level of the segment in relation to a "nesting" structure followed by a repeat count, if necessary, in the final component data element. Explicit and implicit techniques may not be mixed in the same message and the message specification dictates which method is to be employed.

A UNSM message is identified by a 1 to 6 character identifier which appears in the message header record.

DIF: The difference between the two syntaxes in the overall design of transaction sets or messages is very small. Only the current X12 requirement for a beginning segment, in addition to data segments, separates the two. In the areas of looping and nesting however, the ISO use of explicit techniques is not comprehended in the X12 environment and the X12 bounded loop does not exist in the ISO design constructs. Both syntaxes require the user to follow a predefined ordinal structure and both rely on this structure for implied looping and nesting. The introduction in X12 of floating segments is the exception to this rule. It should, however, be noted that X12 has barred the use of the floating designation in any newly developed transaction sets. Current transactions sets using the floating designation have also limited this condition to the NTE segment which is, by definition, not machine processable.

The two syntaxes also use different length identifiers to name the transaction set or message.

IMP: An ISA envelope containing a UNSM which uses the explicit nesting technique would be incomprehensible to an X12 parsing routine. Placing an X12 transaction set which uses bounded loops within a UNB envelope would cause an ISO parser to lose position.

REC: In the area of looping and nesting, it is incumbent upon both syntaxes to accept substantial change. In doing so, however, it should be noted that no current installation is affected. No X12 standard document containing the bounded loop concept has been implemented (the Remittance Advice—820—is being revised) and no UNSM has been proposed which relies on the explicit nesting technique. It is recognized that some transaction sets in X12 development states have used the LS/LE construct and early discussions in UN/WP4 tended toward the inclusion of the explicit technique. It is recognized that some transaction sets in X12 development states have used the LS/LE construct and early discussions in UN/WP4 tended toward the inclusion of the explicit technique in the international invoice. Neither structure, however, is in use by X12 or ISO at this time and, if they are to be removed, now would be the time to do so.

It is recommended that X12.6 be amended to bar the use of bounded loops within X12 transaction sets. The use of implicit looping and nesting methodology should be sufficient for all business information needs addressed by EDI standards and specific rules for the use of implicit techniques should be incorporated in X12.6, X12 Design Rules, ISO 9735, and ECE Message Design Guidelines. The revised X12.6 and proposed X12 Design Rules documents have been modified to create an unambiguous set of rules in this regard and once adopted by X12, these should be proposed for inclusion in ISO 9735.

In the area of transaction set/message naming X12 should change the definition of data element 143 to:

(Spec: Type=ID Min=3 ; Max=6)

This will place X12 in conformance with ISO 9735 without requiring current installations to accept the change unless transaction sets identified by more than 3 characters are to be processed.

TAG: Replace ISO 9735, Section 8, Sub-Section 8.1 with the following:

Within a given message type, repetition of segments or segment sets will be implicitly understood from the sequence of the segments or segment sets as stated in the message specification.

Segments which begin repeating segment sets may not, themselves, be repeated under section 8.1.1 (see clause 8.1.2).

Service segments (see annex B), excluding TXT, shall not be repeated.

Replace ISO 9735, Section 8, Sub-Section 8.1.1 with the following:

8.1.1 Repetition of a single segment

The segments within a message shall appear in the order stated in the message type specification. Therefore a segment may be repeated implicitly by multiple occurrences of the segment at its proper ordinal position within the message. Such repetition must be authorized in the message type specification.

Replace ISO 9735, Section 8, Sub-Section 8.1.2 with the following:

8.1.2 Repetition of a segment set

An ordered set of segments within a message type specification may be repeated implicitly by multiple occurrences of the ordered set at the set's proper ordinal position within the message. The set must be defined by the message type specification. The set as a whole shall bear the requirement specifier of the first segment which appears in the set. If any segment within the set appears, the first segment in the set must appear. The first segment in the set may not appear more than once in each occurrence of the set. If a segment within a conditional segment set is assigned a requirement specification of mandatory, the segment shall be required only if the segment set appears. A mandatory segment must occur after the segment set, to permit proper positioning within the message, when any segment within the set bears a segment identifier which also appears at an ordinal position in the message after the ordinal position of the set.

Replace ISO 9735, Section 9 with the following:

9 Nesting of segments

A segment set may contain a segment set. The contained segment set is subordinate to the segment set which is its parent and to any segment set to which its parent belongs. a subordinate segment set is said to be nested. Indication of nesting shall be implicit in the order of the appearance of the segment set within the message as determined by the message specification. A subordinate segment set may not appear unless its parent appears and may not begin at the same ordinal position or have the same segment identifier as its parent. A subordinate segment set may end prior to or at the same ordinal position as its parent but may not end after its parent. If the parent segment set contains a segment having the same segment identifier as a segment in the subordinate segment set, that segment must appear in the parent before the subordinate segment set begins; unless a mandatory segment appears in the parent after the end of the subordinate segment set and prior to the segment having the same segment identifier.

Remove ISO 9735, Section 9, Sub-Section 9.1 and examples.

Remove ISO 9735, Section 9, Sub-Section 9.2.

Add the following to the ECE Message Design Guidelines.

Within any logical area, segment set, or nested segment set, all stand alone segments belonging to the parent structure (i.e., logical area, segment set, or nested segment set) shall appear in the sequence of segment in an ordinal position prior to any subordinate or nested segment set. Segment sets at the same hierarchical level shall appear contiguously at the end of the parent structure.

G

Functional Groups

- X12:** The X12 definition of functional group states that it is a collection of related transaction sets bounded by a functional group header and functional group trailer. The relationship between the transaction sets in the group is defined in terms of their business function, i.e., purchasing documents. The use of functional groups in X12 is mandatory.
- ISO:** The ISO reference to functional groups defines the structure as a functional group header followed by messages of a similar type and a functional group trailer. No attempt is made to further define "similar type" and the use of functional groups is at the option of the interchange creator. It is understood, but not stated, that the transmission of an ISO interchange to North America will contain the functional group header and trailer segments.
- DIF:** The mandatory or optional use of the functional group structure is the major difference. Both sets of header/trailer segments contain the same base information with the ISO segments adding other data elements. The content of a functional group is poorly defined in ISO.
- IMP:** As long as functional groups are included in interchanges with X12 compatible installation, there should be no discernable impact. Functional grouping is required for X12's current system of syntax acknowledgment messages. All functional acknowledgment activity is based on the presence of functional groups. The adoption of the ISO designation of functional grouping as optional will require a change in the method of acknowledging receipt and syntactic success in deciphering interchanges.
- REC:** X12 remains a viable sub-set in this regard for the short term. Optional use of the functional group should be investigated in conjunction with any project designed to improve error detection and audit trail messaging between trading partners. This need not be a high priority for X12 so long as our international trading partners are willing to include functional groups in their north American interchanges.
- TAG:** The ambiguity in the ISO definition of what messages are "similar" for the purpose of establishing a functional group requires clarification. The data element in the UNG which specifies the group type and the data element in the UNH message header which identifies the message type are different elements but are the same length. The implication, from the remark associated with the UNG data element, is that only one message type, as opposed to related message types, may appear in a functional group. The UNG data element should refer to a defined list of values which identify messages which may be grouped for functional purposes, i.e., Purchase Orders and Purchase Order Change messages.

H

Control Segments

X12: The only X12 interchange header which has been designated as an American National Standard is the ISA. This has not precluded widespread use of the ICS, GS and BG as interchange headers. The function of the interchange control structure is to provide addressing information for the data being transferred between trading partners and the ISA, ICS, GS, and BG meet this basic criterion. Additional functionality varies between these control segments. The primary characteristic of the ISA is that all data elements are mandatory and all have a fixed length. This allows the first occurrence of the data element separator and segment terminator to define those control characters for the balance of the interchange. Space is also provided for a sub-element separator. The associated trailer segments IEA, GE, etc., repeat the interchange control number and specify the number of sub-groups included in the interchange.

The functional grouping of X12 transaction sets is accomplished with the GS/GE header and trailer segment pair. An additional level of sender/receiver addressing is provided along with an indicator identifying the type of transactions to be found in the functional group, a data and time stamp, a functional group control number, the identity of the agency responsible for the transaction sets in the group, and the release/version of the enclosed transaction sets. The GE trailer repeats the functional group control number and specifies the number of transaction sets included in the group.

Individual X12 transaction sets are delimited by the ST/SE segment pair. The transaction set header identifies the exact transaction set in use and provides a transaction set control number. The trailer repeats the control number to ensure proper receipt and specifies the number of segments, including the ST and SE segments, which occurred in the transaction set.

ISO: ISO 9735 defines the UNB as the interchange header and this segment provides the addressing information for the data being transferred. The segment contains variable length elements and conditional elements. No terminators or separators are defined by this segment. If the user chooses control characters other than those specified for the syntax level identified in the UNB segment, a UNA segment must be supplied prior to the UNB. The UNA, service string advice segment, occurs at the option of the sender and is used only to specify control characters for the interchange. The interchange is ended by the UNZ segment and specifies the number of messages or functional groups that were contained in the interchange. The control count will be determined based on whether functional grouping is to be used.

A functional group is delimited by the UNG/UNE segment pair and appears at the option of the sender. The UNG provides a second set of sender/receiver addresses, identifies the type of messages included in the group, provides a date and time stamp, identifies the agency controlling the standard used in the creation of the enclosed message along with release/version number for the message, provides a control number, and allows the sender to supply a password to the receiver's application system. The UNE repeats the control number found in the UNG and provides a count of the messages contained in the group.

An ISO message is enclosed in a UNH/UNT segment pair. The UNH gives the identity of the message set being used, provides a control number for the message, identifies the agency controlling the standard used in creation of the message along with a release and version number for the messages with the same access code, and a transfer status. The UNT repeats

the message control number and provides a count of all segments included in the message including the UNH and UNT segments.

ISO defines two other control segments. The TXT and UNS segments are used within the confines of a message. TXT is the equivalent of the X12 NTE segment and allows the exchange of free format text. The TXT segment is to be defined in UNSMs as a conditional segment with a maximum count of 5. The UNS segment is a delimiter which separates logical areas of a message, such as a detail area or summary.

DIF: The two structures for interchange control are syntactically dissimilar although both convey the same basic semantic content. An element by element discussion is required to resolve what data content is required for true international and domestic use. The syntax issue will also require much discussion. The ISO use of variable element lengths and conditional elements make the UNB more flexible but necessitates the introduction of the UNA to identify control characters if the default still is not in use. The ISO definition of the functional group as optional has been mentioned earlier in this report. Both the UNG and UNH segments have the ability to identify the proper agency and release and version information so that the absence of the functional group header will not mean the absence of information necessary to the proper translation of the message.

REC: In the short term, no major changes are required to either set of control segments. Given the changes recommended in the prior sections of this report, UNSMs would be compatible inside an X12 envelope and X12 transaction sets would be compatible inside an ISO envelope.

X12 should submit a DM to its own maintenance function to add code values for data element ISA11, interchange standards identifier, and ISA12, interchange version Id, to permit an ISO UNSM to be placed in an ISA/IEA envelope. Syntax rules for such an interchange would be that the UNSM would not rely on the release character function of ISO 9735 and the parser would accept a comma in place of a period in any numeric field. The interchange creator would place the component element separator in ISA16, the sub-element separator, and the data element separator and segment terminator would be defined by their usual positions in the ISA.

X12 should submit a DM to its own maintenance function to add a value to the code list for data element 455, responsible agency code, to identify ISO 9735/UNSM. The associated version/release information in data element 480 should coincide with the proper ISO defined version/release for the UNSMs contained in the functional group.

In the long run, it would be beneficial to establish a common set of control segments for use by both standards. Adoption of the ISO structure as it exists is one alternative. Creating the default set of control characters to be associated with the previously recommended ANSA and ANSB syntax levels would relieve part of the X12 community from sending the UNA segment either in the domestic or international arena. A modified version of the ISO control structure is also a possibility open for X12 review and discussion. A specific recommendation can wait until the more basic issues addressed in this report are resolved.

I

Future Developments

While this comparison has attempted to address the X12 and EDIFACT standards as they exist today, it is recognized that both syntaxes are dynamic, living documents. It is intended that as each standard grows in the future the other will grow as well. Bringing the syntaxes into alignment at some isolated point in time and then failing to keep them aligned would be a meaningless exercise. The recommendation of Task Group 6 is that future syntax features be jointly incorporated in the two syntaxes as they are developed and refined. Specifically, the current work in X12 to provide the structures for binary data transfer, encrypted and authenticated information transfers, and service element requests will be brought into the alignment process as they are formalized through the X12 procedures. An on-going process of monitoring and maintaining the two syntaxes should be made a continuing part of the X12 and EDIFACT work.

J

Summary

This paper has identified syntax elements which must be brought into alignment if ANSI ASC X12 and EDIFACT are to become asymmetrical EDI standards. While a common control structure is a goal to be desired, a common syntax is an essential for future growth and development of an internationally shared EDI effort. The ability for both X12 and EDIFACT to continue to develop standards useful in the domestic and international arenas will lead to a more flexible and efficient commercial environment. X12 needs the cooperation of EDIFACT in forming a truly international trading community. EDIFACT needs the years of practical EDI experience represented by X12 in moving to a more robust implementation of evolving international messages. If either body chooses to "go it alone," the one sure loser is the EDI trading community. Whether common data dictionary and segment directory functions are implemented or remain segregated will depend on future efforts. Whether control segments are standardized across all EDI implementations or remain segregated along national boundaries needs to be resolved. Without a common set of syntax rules, however, those issues need not be addressed. Common ground will not be available upon which to build the structure.

As EDIFACT and UN?WP4 continue to develop UNSMs it is expected that many discussions which ASC X12 has conducted over the past 6 years will be revisited from an international perspective. Changes to the syntax which result from these discussions should be carefully documented and incorporated in ISO 9735. The temptation to resolve syntax issues by entering a rule in the ECE Message Design Guidelines should be resisted. Only one document can contain the official syntax rules of the international EDI standard. Design guidelines are desirable and exist in the ASC X12 structure, but these apply to internal activities of standards development and not to user implementation. We must not place the user in a position of being required to understand gentlemen's agreements which are de facto part of the standard but not part of the syntax document.

The final recommendation of this task group is the formation of a joint working group to incorporate a greater degree of specificity in ISO 9735 for the 1992 study period. The overall content of this document, the ASC X12.6 syntax document, the ASC X12 Design Rules, the ECE Message Design Guidelines and the existing ISO 9735 should be incorporated as the beginning reference for this work. The goal is a complete, unambiguous, and maintainable syntax document which will foster rapid growth in the deployment of EDI and a set of design guidelines which will increase the efficiency of transaction set/message designers.

The following is a synopsis of the changes recommended to each syntax. ASC X12C TG6 requests that you give serious consideration to these recommendation. Each change has been viewed in light of current implementations of both X12 and EDIFACT and seeks to serve the needs of both the existing installed base and the future global arena. by and large, these changes are of an upward nature for both standards. Impact on existing implementations should be minimal. Moving forward will require incorporation of these syntax modifications.

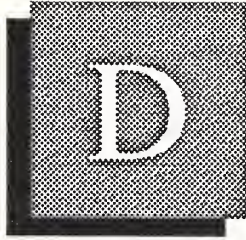
ANSI ASC X12

1. Add ISO 646 as the minimum character encoding scheme when no partnership agreement has been prearranged.
2. Adopt character set levels ANSA and ANSB for use in ISO 9735 envelopes.
3. Adopt the control character definitions specified in the descriptions of ANSA and ANNSB when a UNA segment is not present.
4. Create a subset of the extended X12 character set to identify the national characters “#” and “\$” not to be used internationally.
5. Create a firm set of syntax rules for the use of composite data structures as defined in ISO 9735.
6. Disallow the use of a leading plus sign in numeric data elements.
7. Increase the data element reference number to at least 4 characters.
8. Eliminate all Nn usage except for integer representation.
9. Remove the decimal mark from the TM data type definition and provide for TM data elements to have a length of 4, 6, or greater than 6.
10. Adopt an absolute set of rules for conditional data elements and provide proper syntax notation which does not allow ambiguity.
11. Rename the UNT segment and disallow any other UNX segments.
12. Disallow the use of bounded (LS/LE) loops.
13. Change the transaction set identifier to min. 3, max. 6.
14. Remove the requirement of a beginning segment.
15. Add code value for the responsible agency code in the ISA and GS segments to identify ISO 9735/UNSM.
16. Add UN/EDIFACT version/release 4 codes to be used when the responsible agency code identifies ISO 9735/UNSM messages.

17. Participate in a working group to prepare the 1992 release of ISO 9735 and a unified designer's guide.

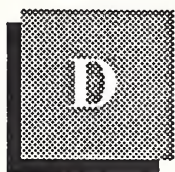
EDIFACT—ISO 9735

1. Identify the default value for the decimal mark for the Level A and Level B character set definitions.
2. Restate the definitions of the Level A character set to state that the control characters remain part of the character set.
3. Reword the release character explanation to be generic rather than specific to the Level A character set and encompass all cases.
4. Suppress all leading zeroes, including those preceding decimal fractions.
5. Provide notation for minimum data elements lengths of greater than 1 for variable length data elements.
6. Define equivalents of X12 data types DT, TM, ID, and NO.
7. Change the segment identifier definition to minimum 2, maximum 3 and allow digits as well as upper case letters.
8. Eliminate explicit nesting and grouping notation.
9. Fully define repeating and looping structures in terms of implicit techniques by rewriting 8.1, 8.1.1, and 8.1.2.
10. Replace the current section 9 on nesting to fully define the syntax rules for the implicit application of a nested structure.
11. Add a rule to the ECE Message Design Guidelines requiring repeating segment sets to occur at the bottom of logical areas.
12. Define functional group identifiers for the UNG segment that allow either single message types or related groups of message types to appear in the same functional group.
13. Participate in a working group to prepare the 1992 release of ISO 9735 and a unified designer's guide.



Appendix: Glossary of EDI-Related Terms





Appendix: Glossary of EDI-Related Terms

AAEC	Association of Agrichemical Electronic Communication - An organization developing EDI standards for the suppliers of agricultural chemicals.
ACCS	Aluminum Customer Communications System - Developed through the Aluminum Association, it has adapted ANSI X12 formats to industry needs.
ACH	Automated Clearing House - A regional center for interbank collections and settlements using electronic records.
ACORD	Agent Company for Research and Development - Developers, with the IIR, of formats for paper and electronic documents used in the insurance industry. These standards are used in IVANS.
AIAG	Automotive Industry Action Group - An industry organization formed to improve the competitiveness of the American automotive industry. It was an early developer of EDI standards.
AISI	American Iron and Steel Institute - The organization establishing EDI standards for steel and aluminum industry products.
ANSI	American National Standards Institute - A nonprofit organization chartered to develop and maintain voluntary American national standards. It is the U.S. representative to the International Standards Organization.

ANSINet	An ANSI X12 system developed by the Motor and Equipment Manufacturers Association (MEMA) to connect automotive aftermarket distributors with their suppliers.
ARINC	Aeronautical Radio INC. - A not-for-profit organization, owned by airlines, that provides communications services to the airlines.
ASAP	Analytical Systems Automated Purchasing - Baxter-Travenol's private system to facilitate ordering.
ASC X12	Accredited Standards Committee - The organization charged by ANSI with the development and maintenance of ANSI X12 standards.
ASCII	American Standard Code for Information Interchange - The standard 7-bit code used for alphanumeric character representation.
BOS	Booksellers Order Service - Developed by the American Booksellers Association to allow electronic ordering from a range of publishers.
CALS	Computer-aided Acquisition and Logistic System - A U.S. Department of Defense initiative to set standards for the submission and interchange, in digital form, of documents from defense contractors.
CCD	Cash Concentration and Disbursement - An ACH format for intracompany and intercompany payment transactions.
CCDX	An expanded CCD transaction used for the U.S. government's Vendor Express payment system.
CCITT	Consultative Committee for International Telegraph and Telephone - The organization, part of the International Telecommunications Union, that establishes recommendations for international communications standards.
CEC	Council of the European Communities.
CEN	European Committee for Standardization, with representatives of all European national standards bodies.
CIDX	Chemical Industry Data Exchange - The EDI program for the chemical industry.

CMEA	Council for Mutual Economic Assistance - The Eastern European block and sphere of influence.
COMPORD	COMPUter ORDering - A customer communications system developed in the 1970s by the American Iron and Steel Institute.
COPAS	Council of Petroleum Accounting Standards - The organization responsible for an early petroleum industry EDI system.
CTP	Corporate Trade Payment - An ACH transaction format that contains payment advice information.
CTX	Corporate Trade Exchange - An ACH transaction format that contains the ANSI X12 Remittance Advice.
DISA	Data Interchange Standards Association - The not-for-profit membership organization that provides secretariat service to ASC X12.
DoD	U.S. Department of Defense.
DSD	Direct Store Delivery - The grocery industry system where suppliers deliver directly to retail outlets rather than to warehouses. It is the focus of recent EDI development activity in the grocery industry.
EBCDIC	Extended Binary Coded Decimal Interchange Code - The IBM standard 8-bit code used for alphanumeric character representation.
ECE Economost	The United Nations' Economic Commission for Europe. The McKesson Corporation's proprietary system for communicating with retail druggists for order entry.
EDI	Electronic Data Interchange - The interorganizational computer application-to-computer application, electronic interchange of structured business data.
EDIA	Electronic Data Interchange Association - The new name of the TDCC.
EDICC	EDI Council of Canada - The umbrella EDI organization in Canada.
EDICUS	EDI Council of the USA - A user group chartered to promote the concept of EDI within the business environment.

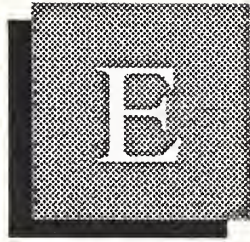
EDIFACT	EDI For Administration, Commerce and Trade - The United Nations EDI standard.
EDX	Electronic Data Exchange - The EDI standards for the electrical supply industry.
EFT	Electronic Funds Transfer - A generic term for electronic payment. Any system for moving funds between bank accounts at different depository institutions.
EIDX	Electronic Industry Data Exchange - The EDI standards for the electronic industry.
EMBARC	Electronic Manifest BAR Code - The paper industry's EDI standard for the electronic transmission of shipping manifests from mill to printer.
EMCS	Electronic Media Claims Submissions - A service used for submitting claims to health insurance carriers, using electronic versions of formats developed in support of Medicare claims processing.
FASLINC	Fabric and Apparel Suppliers LINKage Council - The organization setting EDI standards for this segment of the textile industry.
FAX	Facsimile - A system for the electronic transmission of document images.
Fedwire	The U.S. Federal Reserve System's wire transfer system.
FEMA	Farm Equipment Manufacturers Association—An industry association developing EDI standards for the "short line" farm equipment manufacturers.
GCA	Graphic Communications Association - The paper industry group responsible for the EMBARC standard.
GTDI	Guidelines for Trade Data Interchange - A European standard for international shipping. Its formal name is UN/ECE GTDI and is sometimes referred to as TDI or UN/TDI.
HIBCC	Health Industry Bar Code Council - An organization coordinating ANSI X12 use in the health care industry.

HIDA	Health Industry Distributors Association - An industry group developing EDI standards for charge backs and contract awards.
ICOPS	Industry Committee on Office Product Standards - A joint EDI project of the National Office Product Standards and the Wholesale Stationers' Association.
IGES	Initial Graphic Exchange Standard - A standard, supported by the Automotive Industry Action Group (AIAG) among others, for the exchange of computer-aided design (CAD) data between systems.
IIR	Insurance Institute for Research - The organization that developed (with ACORD) formats for paper and electronic documents. These formats are used in IVANS.
ISO	International Standards Organization - The organization responsible for developing voluntary international standards.
IVANS	Insurance Value Added Network Service - A not-for-profit organization that provides communications between independent agents and member insurance carriers, using either company-specific formats or the IIR/ACORD formats.
JADE	Joint Audit Data Exchange - Developed by COPAS (Council of Petroleum Accounting Standards) to audit joint producing properties.
JAEX	See JADE.
MEMA	Motor & Equipment Manufacturers' Association - A trade association for automotive aftermarket manufacturers.
MSC	Management Systems Council - The section of the American Trucking Associations that develops and maintains EDI standards for the motor freight industry.
NACHA	National Automated Clearing House Association - A national association of regional ACH clearing house associations that coordinated ACH rules and standards.
NAEB	North American EDIFACT Board - The rapporteur advisory and support team of the EDIFACT rapporteur for North America (part of ANSI X12).

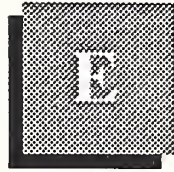
NEIC	National Electronic Information Corporation - A clearing house for insurance carriers that provides a service supporting Electronic Media Claims Submissions (EMCS).
NWDA	National Wholesale Druggists' Association - The trade association that developed Ordernet, the EDI service for the pharmaceutical industry.
ODETTE	Organization for Data Exchange Through Telecommunications in Europe - An EDI standard used by European automotive manufacturers.
OSI	Open Systems Interconnection - A structure, based on a seven-layer model developed by the ISO, for computer communications systems.
PDES	Product Data Exchange Specification - An emerging standard supporting both geometric and nongeometric (tolerances, manufacturing features, material properties, surface finish, etc.) data.
PetroDex	An EDI application for the petroleum industry using proprietary formats.
PetroEx	A set of industry-specific remote computing services for the petroleum industry.
PIDX	Petroleum Industry Data eXchange - A task group within the American Petroleum Institute that is developing EDI standards for the petroleum industry.
PipeNet	Pipeline industry-specific transactions (nominations, schedules, ticket readings, etc.), adapted by the American Petroleum Institute from ANSI X12.
PTT	Post, Telegraph, and Telephone - A generic name for a government agency responsible for operating a nation's communications services and systems.
Pubnet	An EDI service sponsored by the National Association of College Stores and the Association of American Publishers. It is a hybrid system with interactive searches prior to electronic purchase.

Rapporteur	An individual expert appointed by the United Nations for specific objectives. The person chartered to organize and coordinate standards development work for a given area of responsibility and for delivering the work product to the chartering body.
RFP	Request For Proposal.
SAFLINC	Sundries and Apparel Findings LINKage Council - The organization setting EDI standards for this segment of the textile industry.
SCC JTC/EDI	Standards Council of Canada Joint Technical Committee on Electronic Data Interchange
Secretariat	The administrative department of an organization; an organization that supplies administrative services to another body. The UN Secretariat, with a Secretary-General, supplies administrative services to the United Nations, an International Treaty organization composed of national entities.
SENDEN	SEars National Data Exchange Network - A proprietary network for supplier communications with Sears, Roebuck.
SITA	Société Internationale de Télécommunications Aéronautique - An international not-for-profit organization that provides communications services to the world's airlines.
SQL	Structure Query Language - A language for data base inquiry.
STEDI	Sears Transport EDI - An EDI service offering by Sears Communications Company. It is an open third-party network offering with full interconnection.
TALC	Textile Apparel Linkage Council - A standards body in the textile industry.
TAMCS	Textile Apparel Manufacturer's Communications Standards - An EDI standard approved by TALC for product descriptions between cutters and fabric suppliers.
TCIF	TeleCommunications Industry Forum - A standards body developing guidelines for EDI in the telecommunications industry.

TDCC	Transportation Data Coordinating Committee - The original U.S. trade association dedicated to fostering EDI.
TDI	Trade Data Interchange - A European standard for international shipping. Its formal name is UN/ECE Guidelines for Trade Data Interchange (UN/ECE GTDI) and is sometimes referred to as UN/TDI.
TEDIS	Trade Electronic Data Interchange Systems - A program of the Council of the European Communities (CEC) started in 1987.
TRADACOMS	A domestic United Kingdom EDI standard developed by its Article Number Association. There are no plans to merge this standard into EDIFACT.
TransNet	The EDI system for connecting automotive aftermarket distributors to manufacturers.
UCC	Uniform Code Council - The not-for-profit organization developing standards for the grocery industry.
UCS	Uniform Communications Standard - The EDI standard developed by the UCC for the grocery industry.
UIG	Utility Industry Group - Organization setting EDI standards for the electric, gas, and water utilities.
UNTDDED	United Nations Trade Data Elements Director standards for data fields.
UNSM	United Nations Standard Message - The EDIFACT term for a transaction set.
UPC	Uniform Product Code - The bar code standard for the grocery industry.
UtilEDI	Utility EDI - EDI standards for use between the electric, gas, and water utilities and their suppliers.
VICS	Voluntary Interindustry Communications Standards - EDI standards between apparel manufacturers and retailers.



Appendix: EDI-Related Standards Organizations



Appendix: EDI-Related Standards Organizations

- AAEC** (Association of Agrichemical Electronic Communications)
c/o Transportation Data Coordinating Committee
225 Reineckers Lane
Suite 550
Alexandria, VA, 22314
(703) 838-8042
- ACCS** (Aluminum Customer Communications System)
c/o Aluminum Corporation of America
1501 ALCOA Building
Pittsburgh, PA, 15209
(412) 553-2891
- AIAG** (Automotive Industry Action Group)
26200 Lahser Road
Suite 200
Southfield, MI, 48034
(313) 358-3570
- AIR** (Transportation Standards for Air Freight)
Transportation Data Coordinating Committee
225 Reineckers Lane
Suite 550
Alexandria, VA, 22314
(703) 838-8042

ANSI X12 Data Interchange Standards Association (DISA)
1800 Diagonal Road
Suite 355
Alexandria, VA, 22314
(703) 548-7005

Aerospace Industries Association ANSI X12
c/o LTV Aerospace and Defense Company
P.O. Box 225907
Dallas, TX, 75265
(214) 266-4313

Government Project Team
c/o Price Waterhouse
One American Center
Suite 2000
Austin, TX, 78701
(512) 476-6700

International Project Team
c/o Price Waterhouse
200 East Randolph Drive
Chicago, IL, 60601
(312) 565-1500

CIDX (Chemical Industry Data Exchange)
c/o DuPont Company
1007 Market St.
Mellon Bank # 1412
Wilmington, DE, 18998
(302) 774-2425

DISA Data Interchange Standards Association (DISA)
1800 Diagonal Road
Suite 355
Alexandria, VA, 22314
(703) 548-7005

EAGLE (Hardware Industry Standards)
c/o OrderNet Services
1651 NW Professional Plaza
Columbus, OH, 43220
(614) 459-7600

EDIA (The EDI Association)
225 Heineckers Lane
Suite 550
Alexandria, VA, 22314
(703) 838-8042

EDICC	(EDI Council of Canada) 5401 Eglington Avenue West Suite 103 Etobicoke, ON, CANADA (416) 621-7160
EDX	(Electronic Data Exchange) 2101 L Street, NW Suite 300 Washington, DC, 20037 (202) 457-8413
EIDX	(Electronics Industry Data eXchange) American Electronics Association 5201 Great American Parkway Suite 520 Santa Clara, CA, 95054 (408) 987-4200 Electronics Industry Data Exchange Association c/o Hewlett-Packard 8000 Foothills Blvd. Roseville, CA, 95678 (916) 786-8000
EMBARC	(Electronic Manifest BAR Code) Graphic Communications Association 1730 North Lynn Street Suite 604 Arlington, VA, 22209 (703) 841-8160
FASLINC	(Fabric and Apparel Suppliers LINKage Council) c/o American Textile Manufacturers Association 1801 K Street, NW Suite 900 Washington, DC, 20006 (202) 862-0518
HIBCC	(Health Industry Business Communications Council) 5110 N. 40th Street Suite 120 Phoenix, AZ, 85018 (602) 381-1091
MOTOR	(Transportation Standards for Motor Freight) American Trucking Associations MSC 2200 Mill Road Alexandria, VA, 22314 (703) 838-1721

- NACHA (National Automated Clearing House Association)
1901 L Street, NW
Suite 640
Washington, DC, 20036
(202) 659-4343
- NIT League (Standards for Car Locator Messages)
National Industrial Transportation League
1090 Vermont Avenue, NW
Suite 410
Washington, D.C. 20005
(202) 842-3870
- OCEAN (Transportation Standards for Ocean Freight)
Transportation Data Coordinating Committee
225 Reineckers Lane
Suite 550
Alexandria, VA, 22314
(703) 838-8042
- PIDX (Petroleum Industry Data eXchange)
American Petroleum Institute
1220 L Street, NW
Washington, DC, 20005
(202) 682-8000
- PipeNet (Pipeline Transactions)
American Petroleum Institute
1220 L Street, NW
Washington, DC, 20005
(202) 682-8000
- RAIL (Transportation Standards for Rail Freight)
Association of American Railroads
50 F Street NW
Washington, DC, 20001
(202) 639-2100
- Standards Maintenance Committee
c/o Union Pacific
1416 Dodge Street
Omaha, NE, 68179
(402) 271-4174
- SAFLINC (Sundries and Apparel Findings LINKage Council)
c/o American Apparel Manufacturers Association
2500 Wilson Boulevard
Arlington, VA, 22201
(703) 524-1864

SIMPROFRANCE

61 Rue de L'Arcade
75008 Paris, FRANCE
293-0302

SITPRO

Almack House
26/28 King Street
London SW1 Y6QW, UNITED KINGDOM
930-0532

TAMCS

(Textile Apparel Manufacturers' Communications Standards)
c/o Haggar Apparel Co.
6113 Lemmon Avenue
Dallas, TX, 75209
(214) 352-8481

TCIF

(TeleCommunications Industry Forum)
c/o Exchange Carriers Association
5430 Grosvenor Lane
Suite 200
Bethesda, MD, 21814
(301) 564-4505

TEDIS

(General Business Committee of the European Community)
DG XIII
200 rue de la Loi
B-1049 Brussels, BELGIUM
(322) 235-7330

TRANSNET (Motor and Equipment Manufacturers Association)

Management Information Systems Group
300 Sylvan Avenue
Englewood Cliffs, NJ, 07632
(201) 569-8500

UCS

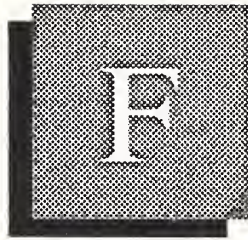
(Uniform Communications Standard)
Uniform Code Council, Inc.
P.O. Box 1224
Dayton, OH, 45401
(513) 435-3870

UTILedi

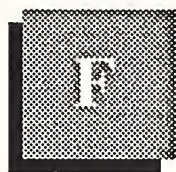
(Utilities Industries EDI)
c/o Consumers Power Co.
212 West Michigan Avenue
Jackson, MI, 49201
(517) 788-0890

VICS (Voluntary Interindustry Communications Standard)
 c/o Levi Strauss & Co.
 1155 Battery Street
 San Francisco, CA, 94111
 (415) 544-4187

WINS (Warehouse Information Network Standards)
 c/o Merchants Refrigerating Co.
 2050 Lapham Drive.
 Modesto, CA, 95353
 (209) 578-3991



Appendix: Industry Associations Involved in EDI



Appendix: Industry Associations Involved in EDI

Aerospace/Air Transport

Aerospace Industries Association of America
1250 Eye Street, NW
Washington, DC, 20005
(202) 371-8400

Air Transport Association of America
1709 New York Avenue, NW
Washington, DC, 20006
(202) 626-4000

Agricultural

Farm Equipment Manufacturers' Association
243 North Lindbergh Boulevard
St. Louis, MO, 63141
(314) 991-0702

Apparel

American Apparel Manufacturers' Association
2500 Wilson Boulevard
Arlington, VA, 22201
(703) 524-1864

Textile-Apparel Linkage Council (TALC)
c/o Haggard Apparel Co.
6113 Lemmon Avenue
Dallas, TX, 75209
(214) 352-8481

Voluntary Interindustry Communications Standard (VICS)
c/o Levi Strauss & Co.
1155 Battery Street
San Francisco, CA, 94111
(415) 544-4187

Automotive

Automotive Industry Action Group (AIAG)
26200 Lahser Road
Suite 200
Southfield, MI, 48034
(313) 358-3570

Motor and Equipment Manufacturers' Association (MEMA)
300 Sylvan Avenue
Englewood Cliffs, NJ, 07632
(201) 569-8500

Banking

National Automated Clearing House Association (NACHA)
1901 L Street, NW
Suite 640
Washington, DC, 20036
(202) 659-4343

National Corporate Cash Management Association
P.O. Box 7001
Newtown, CT, 06470
(203) 426-3007

Electronics

American Electronics Association
5201 Great American Parkway
Suite 520
Santa Clara, CA, 95054
(408) 987-4200

Electronic Industries Association
1722 Eye Street, NW
Washington, DC, 20006
(202) 457-4900

National Electronic Distributors' Association
35 E. Wacker Drive
Suite 320
Chicago, IL, 60601
(312) 558-9114

General Business

Council of Logistics Management
2803 Butterfield Road
Suite 380
Oak Brook, IL, 60521
(312) 574-0985

Data Interchange Standards Association (DISA)
1800 Diagonal Road
Suite 355
Alexandria, VA, 22314
(703) 548-7005

International Customer Service Association
111 E. Wacker Drive
Suite 600
Chicago, IL, 60601
(312) 644-6610

National Association of Credit Management
520 8th Avenue
New York, NY, 10018
(212) 947-5070

National Association of Purchasing Management
P.O. Box 22160
Tempe, AZ, 85282
(602) 752-6276

National Industrial Distribution Association
1900 Arch Street
Philadelphia, PA, 19103
(215) 564-3484

National Retail Merchants' Association
100 West 31st Street
New York, NY, 10001
(212) 244-8451

Grocery

Food Marketing Institute
1750 K Street, NW
Suite 700
Washington, DC, 20006
(202) 452-8444

Grocery Manufacturers of America
1010 Wisconsin Avenue, NW
Suite 800
Washington, DC, 20007
(202) 337-9400

International Association of Chain Stores
3800 Moore Place
Alexandria, VA, 22305
(703) 549-4525

National-American Wholesale Grocers' Association
201 Park Washington Court
Falls Church, VA, 22046
(703) 532-9400

National Food Brokers' Association
1010 Massachusetts Avenue, NW
Washington, DC, 20001
(202) 789-2844

National Grocers' Association
1825 Samuel Morse Drive
Reston, VA, 22090
(703) 437-5300

National Soft Drink Association
1101 Sixteenth Street, NW
Washington, DC, 20036
(202) 463-6752

Uniform Code Council, Inc.
P.O. Box 1224
Dayton, OH, 45401
(513) 435-3870

Health Industry

Health Industry Business Communications Council (HIBCC)
5110 N. 40th Street
Suite 120
Phoenix, AZ, 85018
(602) 381-1091

International Trade
EDI Council of Canada (EDICC)
5401 Eglington Avenue West
Suite 103
Etobicoke, ON, CANADA
(416) 621-7160

General Business Committee of the European Community
(TEDIS)
DG XIII
200 rue de la Loi
B-1049 Brussels, BELGIUM
(322) 235-7330

National Trade Facilitation Council/National Commission
on International Trade Documentation (NCITD)
350 Broadway
Suite 205
New York, NY, 10013
(212) 925-1400

North American International EDI Users' Group (NAIEUG)
c/o Sea-Land Corp.
P.O. Box 1050
Elizabeth, NJ, 07207
(201) 820-7669

SIMPROFRANCE
61 Rue de L'Arcade
75008 Paris, FRANCE
293-0302

SITPRO
Almack House
26/28 King Street
London SW1 Y6QW, UNITED KINGDOM
930-0532

Metals

Joint Committee of the Metals Industry (Aluminum)
c/o Aluminum Corporation of America
1501 ALCOA Building
Pittsburgh, PA, 15209
(412) 553-2891

Joint Committee of the Metals Industry (Iron and Steel)
c/o Bethlehem Steel Corporation
701 E. Third St.
Suite 521E
Bethlehem, PA, 18061
(215) 694-2072

Office Products

National Office Products Association
301 N. Fairfax Street
Alexandria, VA, 22314
(703) 549-9040

Wholesale Stationers' Association
3166 Des Plaines Avenue
Des Plaines, IL, 60018
(312) 297-6882

Petroleum

American Petroleum Institute
1220 L Street, NW
Washington, DC, 20005
(202) 682-8000

Council of Petroleum Accounting Societies

Energy Telecommunications and Electrical Association
P.O. Box 795038
Dallas, TX, 75379
(214) 578-1900

Pharmaceuticals

National Wholesale Druggists' Association
105 Oronoco Street
Alexandria, VA, 22314
(703) 684-6400

Printing

Graphic Communications Association
1730 North Lynn Street
Suite 604
Arlington, VA, 22209
(703) 841-8160

Railroads

Association of American Railroads
50 F Street NW
Washington, DC, 20001
(202) 639-2100

Telecommunications

Telecommunications Industry Forum (TCIF)
c/o Exchange Carriers' Association
5430 Grosvenor Lane
Suite 200
Bethesda, MD, 21814
(301) 564-4505

Textiles

American Textile Manufacturers' Association
1801 K Street, NW
Suite 900
Washington, DC, 20006
(202) 862-0518

Transportation

National Industrial Transportation League
1090 Airmont Avenue, NW
Suite 410
Washington, DC, 20005
(202) 842-3870

TDCC - The EDI Association
225 Reineckers Lane
Suite 550
Alexandria, VA, 22314
(703) 838-8042

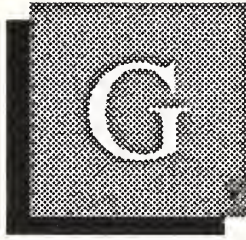
Trucking

American Trucking Associations
2200 Mill Road
Alexandria, VA, 22314
(703) 838-1721

Utilities

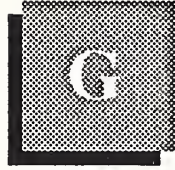
American Public Power Association
2301 M Street, NW
Washington, DC, 20037
(202) 775-8300

Edison Electric Institute
1111 19th Street, NW
Washington, DC, 20036
(202) 778-6400



Appendix: International EDI Organizations and Contacts





Appendix: International EDI Organizations and Contacts

Austria

Austriapro
Helge Schroener
Wiedner Hauptstrasse 63
P.O. Box 150
A-1040 Vienna, Austria
Tel: 43-1-6505-4380

Australia

Michael Baker
CEO
Electronic Data Interchange
Council of Australia
635 Glenferrie Road
Hawthorn, Victoria 3122
Tel: (03) 819-6860
Fax: (03) 818-3129

Belgium

EDIFACT Board Secretariat/ECE
Sverre Bauck
EDIFACT Board Secretariat
200 Rue de la Loi
Brussels, B1049 Belgium
Tel: 32-2-235-1475

Belgium

CEFIC/EDI
Rutger Hopster
Avenue Louise 250/71
B1050 Brussels, Belgium
Tel: 32-2-640-2095
Fax: 32-2-640-1981

Canada

Marshall Spence
President
EDI Council of Canada
5401 Eglinton Avenue, West
Suite 102
Etobicoke, Ontario M9C 5K6 Canada
Tel: (416) 621-7160
Fax: (416)-620-9175

Denmark

Curt Danielsen
DanPro
c/o Federation of Danish Industries
H.C. Andersens Boulevard 18
DK-1596 Copenhagen V Denmark
Tel: 33-1-42930302

France

Bernard Stoven
SIMPROFRANCE
61 Rue de l'Arcade
F-75008 Paris France
Tel: 358-069-59230

Iceland

S. Juliusson
Minstry of Finance
IS-15-15- Reykjavik, Iceland
Tel: 354-1-60-9200

Italy

EDIForum Italia
Antonio A. Martino
Presidente
EDIForum Italia
Piazza Leonardo Da Vinci, N32
20133 Milan, Italy
Tel: 02-2-399-24512
Fax: 02-2-664-634 (Note: only 7 characters in this fax number)

Norway

K. Isaksen
NORPRO
P.O. Box 2526
Solli
Oslo 2 No203 Norway
Tel: 472-557-032

The Netherlands

Wim de Jong
Sitpronh
c/o EDIForum
P.O. Box 102
Woerden, NL 3440AC The Netherlands
Tel: 31-34 8024100

Sweden

Hans Armfelt Hansell
Executive Director
Swedish Trade Procedures Council
Box 450
401 27 Gothenborg, Sweden
Tel: 46-31-637277

Switzerland

Mr. C. Blaser
SWISSPRO
P.O. Box 1458
Bern, CH3001 Switzerland
Tel: 4131-2558-11

Switzerland

UN/ECE
Alain Bellego
UN/ECE Working Party 4 Secretariat
Palais des Nations
Geneva 10, CH 1211 Switzerland
Tel: 41-22-734-6011

Poland

Eastern European EDIFACT Rapporteur
Eugene Danikiewicz
Foreign Trade DATA Centre
ul. Stepinska 9
00.739 Warsaw, Poland
Tel: 48-22-413194

United States

North American EDIFACT Rapporteur
Nicole V. Wallenz
Manager of EDI Systems
Price Waterhouse
200 East Randolph Drive
Chicago, IL 60601
Tel: (312) 565-1500
Fax: (312) 565-1540

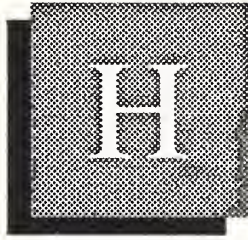
Potential Australian/New Zealand Rapporteur
Harvey Bates, M.B.E.
28 Sulman Place
Swinger Hill A.C.T. 2606
Tel: (062) 865671

EDIA-United Kingdom
Richard Dale
EDIA-UK
Venture House
29 Glasshouse Street
London, W1R 5RG, United Kingdom
Tel: (44) 1-287-3525
Fax: (44) 1-287-5751

United Kingdom
Western European EDIFACT Reppporteur
Raymond Walker
Chief Executive
SITPRO
Venture House
29 Glasshouse Street
London, W1 5RG United Kingdom
Tel: (44) 1-287-3525
Fax: (44) 1-287-5751

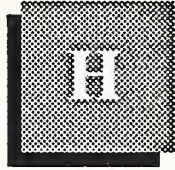
Japanese have expressed interest, have not proposed a name

Belgium
International Data Exchange Association (IDEA) (Regional, Europe)
Virginia S. Cram
Secretary General
68 Avenue d' Auderghem, Bte 34
B-1040 Brussels, Belgium
Tel: 32-2-736-9715
Fax: 32-2-736-9821



Appendix: EDI-Related Associations and Organizations— Description of Responsibilities and Organization Charts





Appendix: EDI-Related Associations and Organizations— Description of Responsibilities and Organization Charts

EXHIBIT H-1

ASC X12 ORGANIZATION

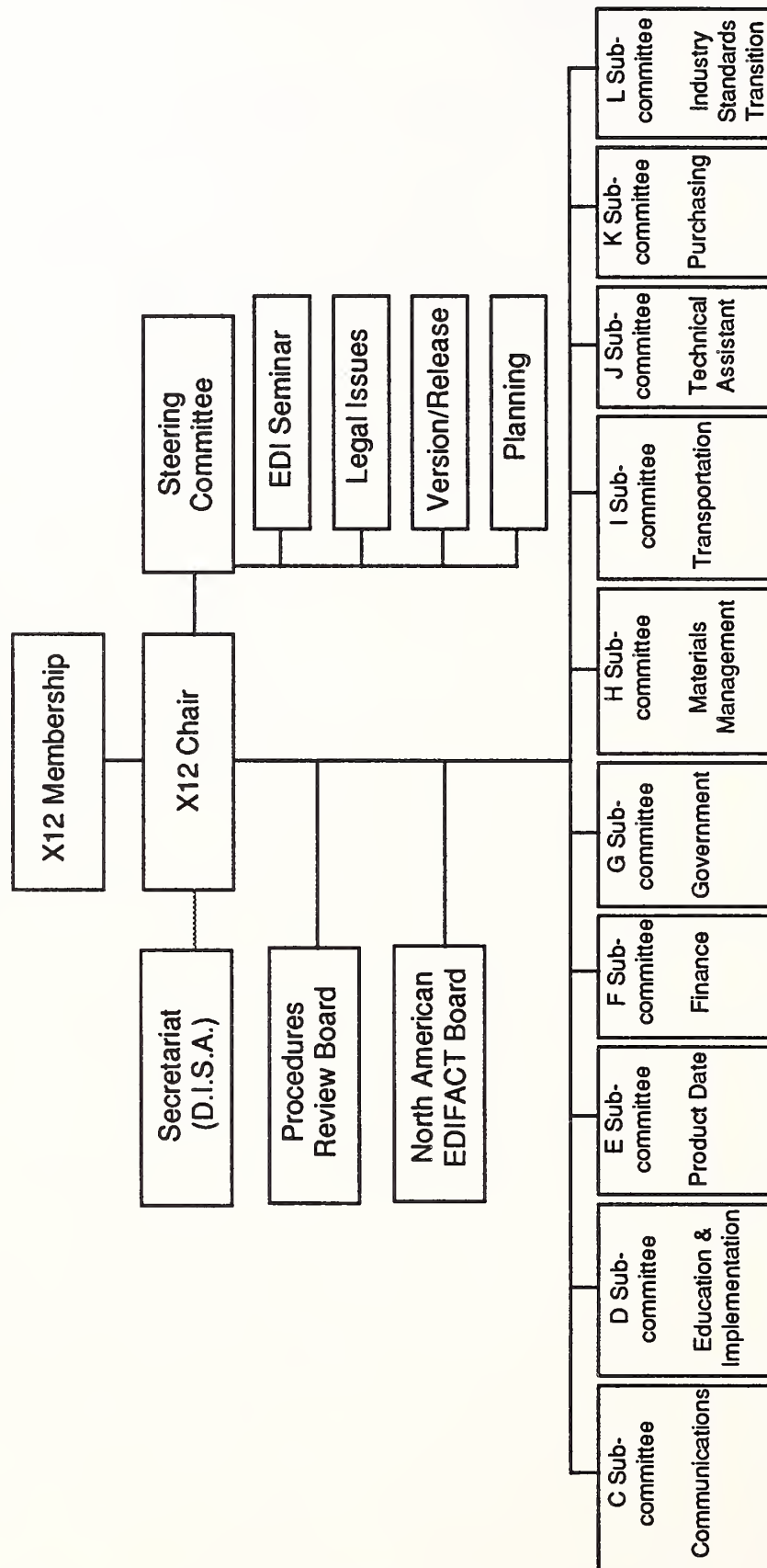


EXHIBIT H-2

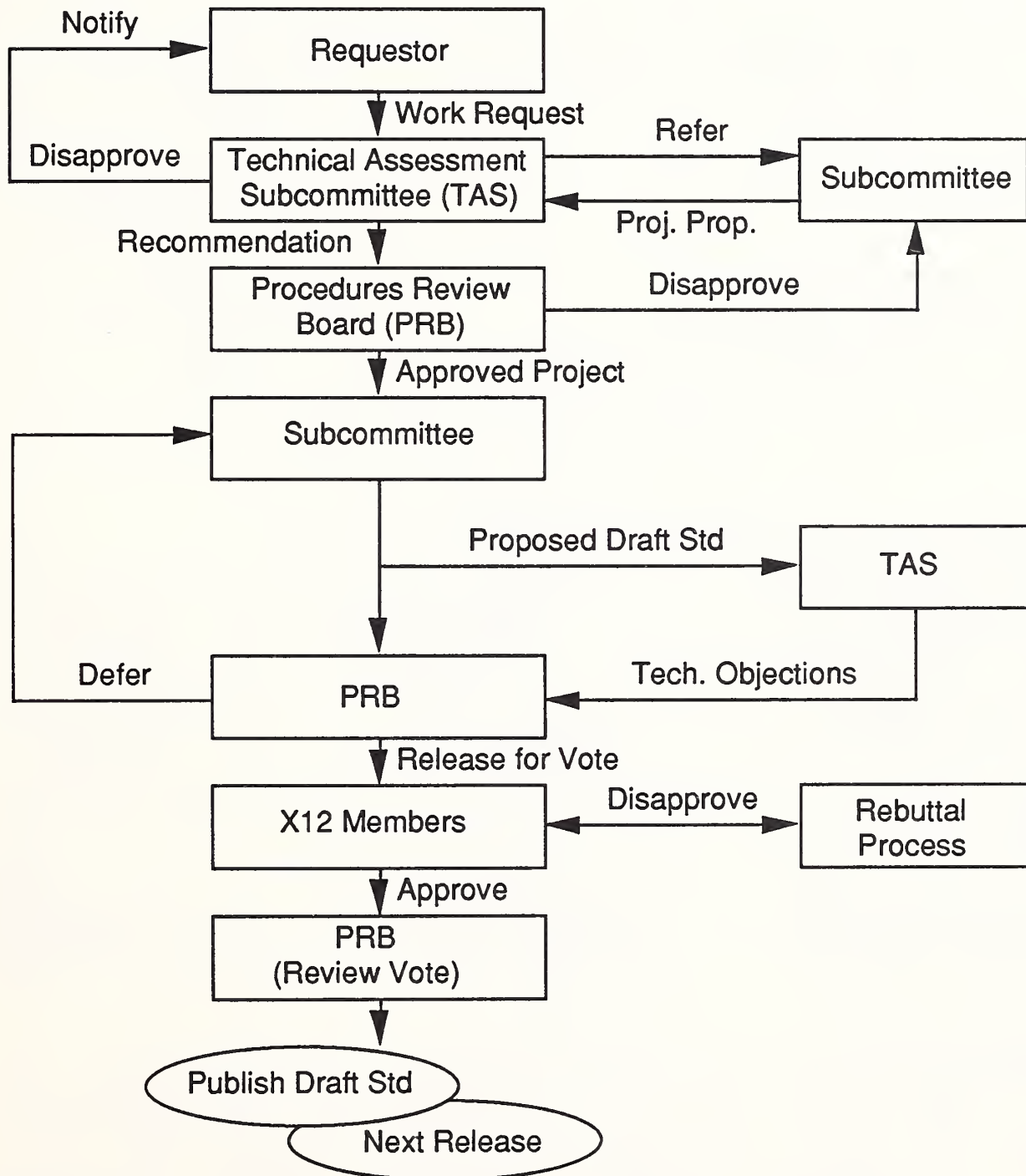
ASC X12 Development Flowchart

EXHIBIT H-3

United Nations Organization Structure

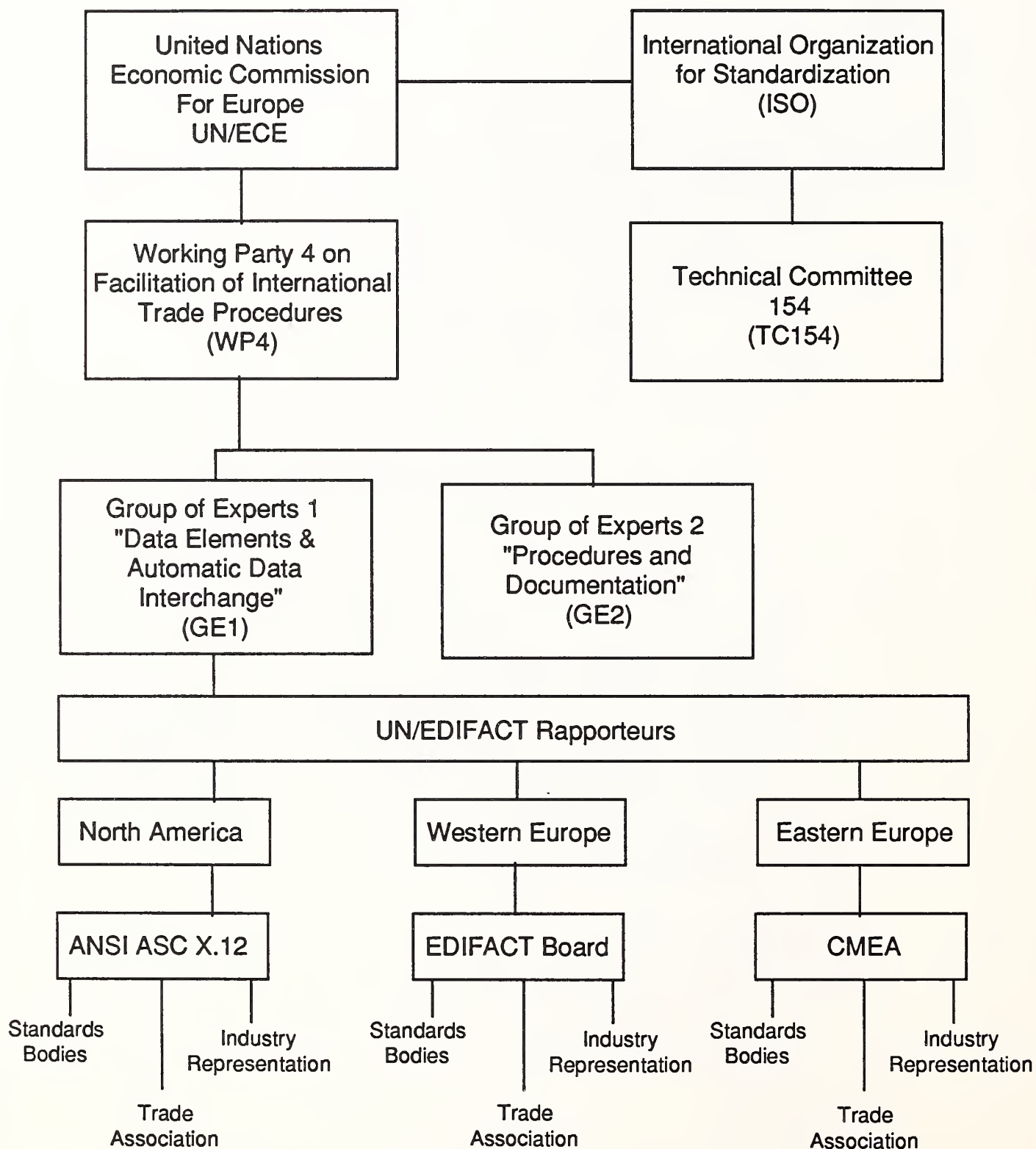


EXHIBIT H-4

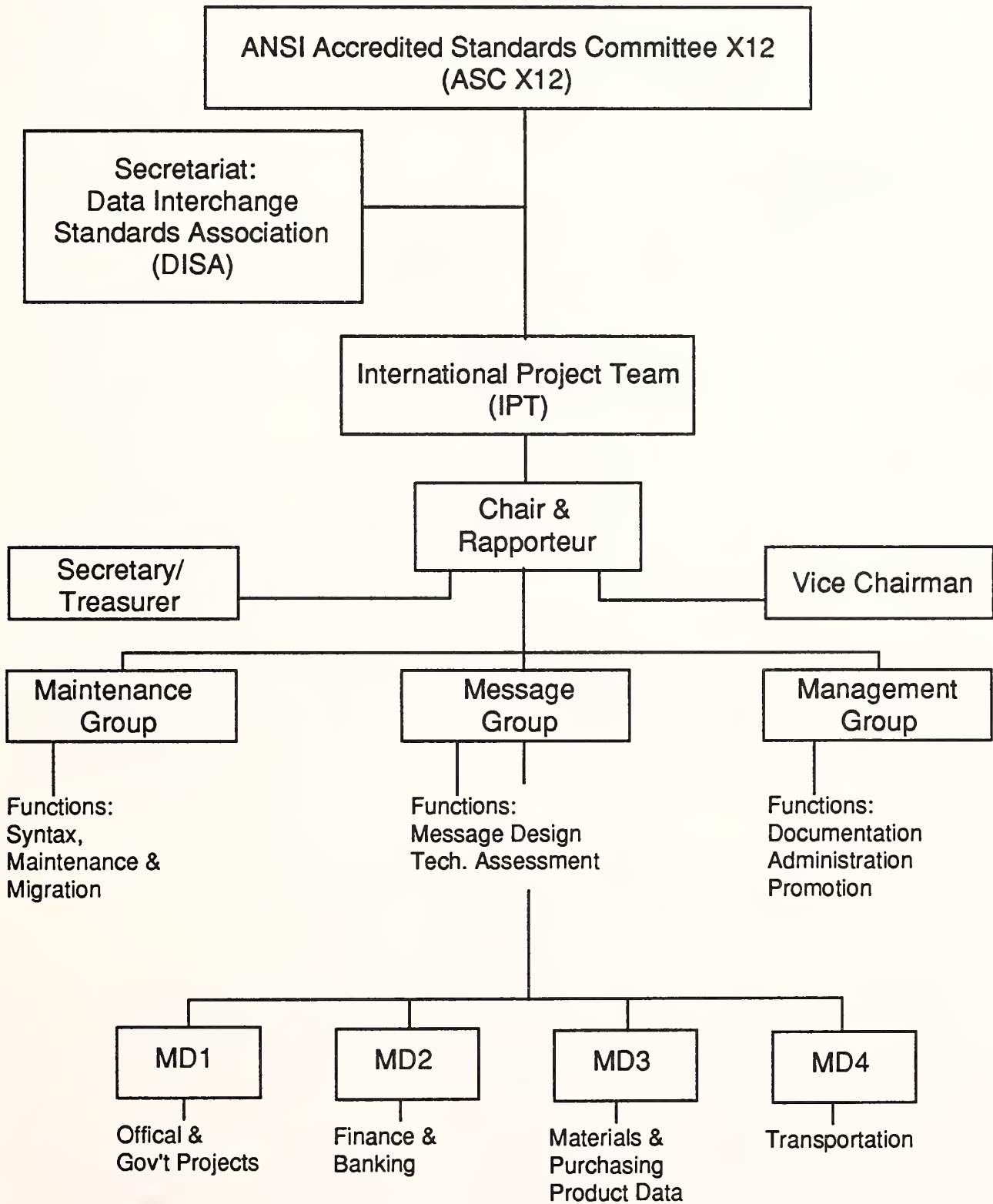
North American Rapporteur Structure

EXHIBIT H-5

Western European Rapporteur Structure

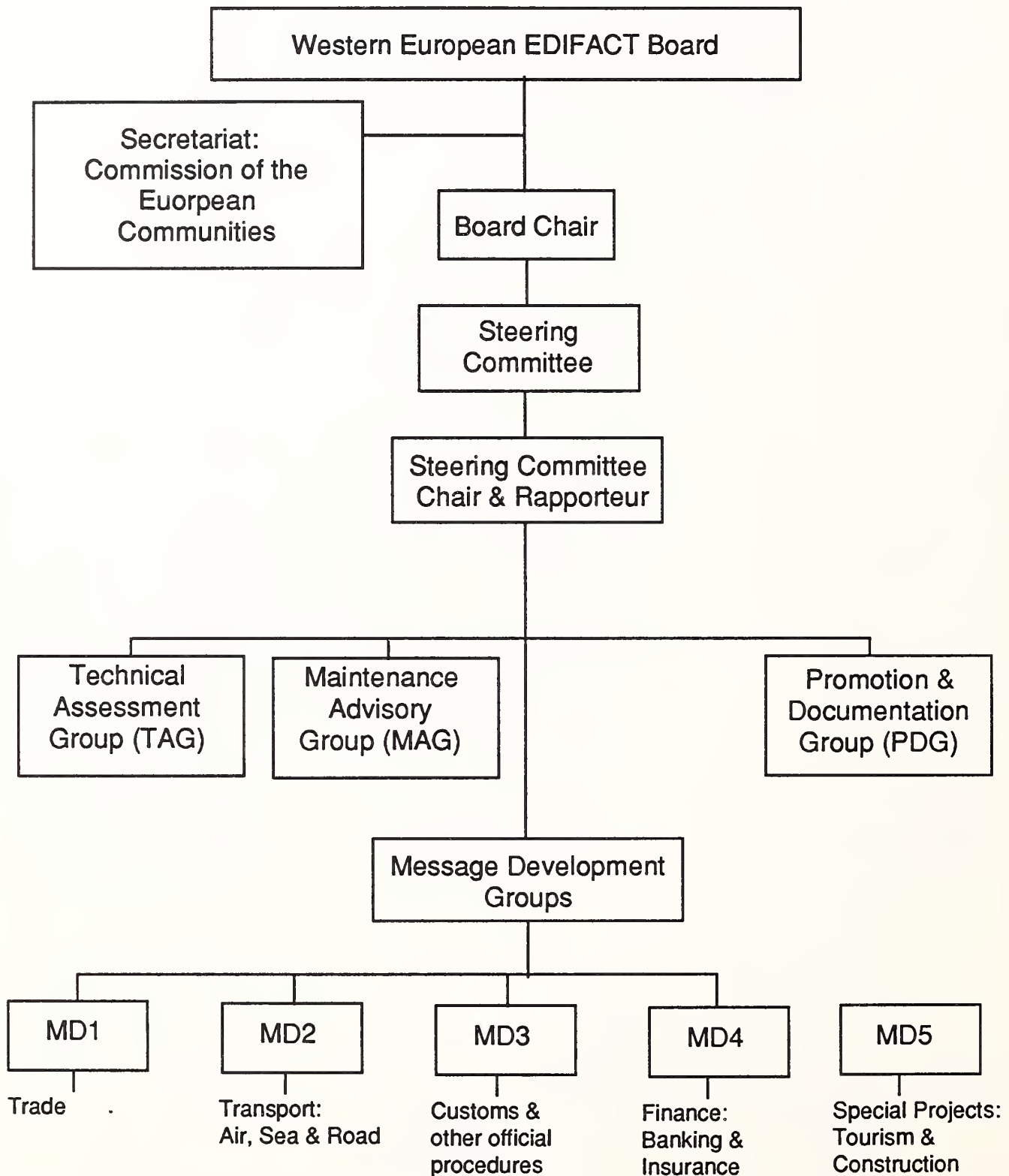
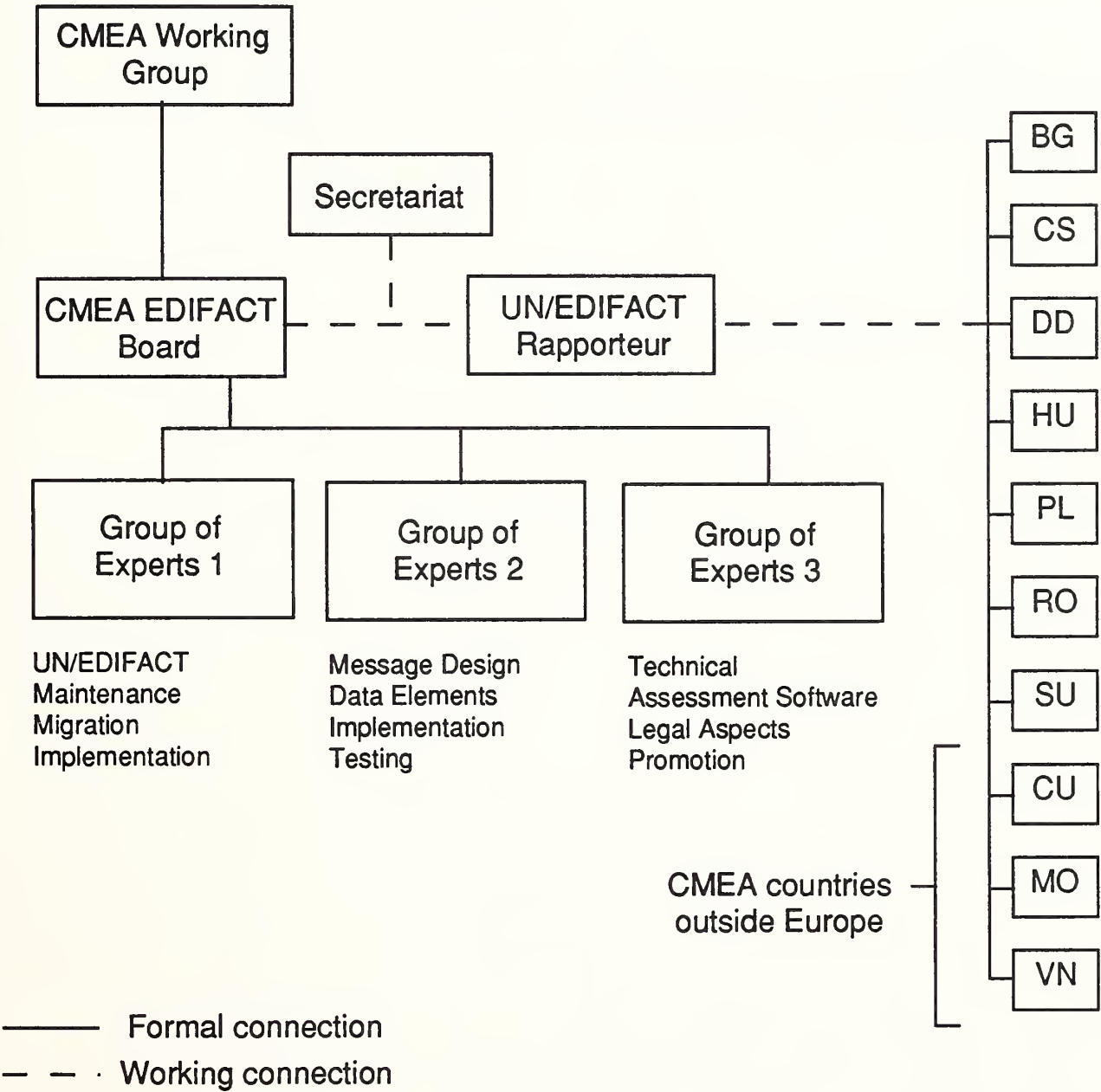
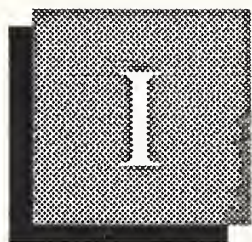


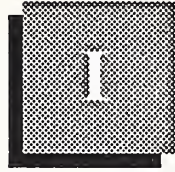
EXHIBIT H-6

**Proposed Eastern European (CMEA) Work Organization
for UN/EDIFACT**





Appendix: References/Bibliography



Appendix: References/Bibliography

EDI Standards Reference Guide by Joseph F. Norton and Victor S. Wheatman, INPUT, 1989.

EDI Standards: A Guide for Existing and Prospective Users, a Vanguard Report, 1989.

One to Get Ready by Bernell Stone, CoreStates Banks, 1989.

Electronic Data Interchange: An Executive Summary by Digital Equipment Corporation, 1988.

EDI: The Competitive Edge by Phyllis Sokol, McGraw Hill, 1988.

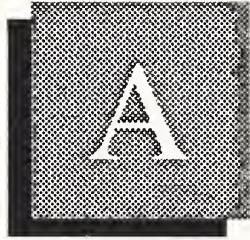
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2

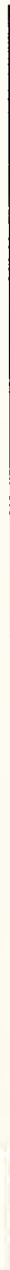
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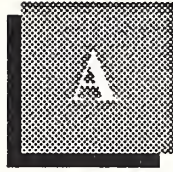
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1



Questionnaire: EDI User— North America





Questionnaire: EDI User (North America)

This section contains the EDI User, EDIFACT User, Government Agency and Vendor questionnaires. For the sake of simplicity, only the questionnaires that were used for North American are shown. The questionnaires for Europe and the Pacific Rim are essentially the same, with minor modifications to reflect appropriate differences between the regions.

Hello. My name is _____. I'm calling from INPUT, the EDI research company in California.

We're doing a special study on EDIFACT for the EDI Association in Washington. It's a very important project and we'd like your help on it. You've been selected because we know you're using EDI at your company. The results of our survey will be published by the EDI Association, and presented at the December conference in Washington. We will provide a summary of the findings to the respondents of this survey.

I have just a few short questions—it won't take more than 10 minutes. Is now a good time, or should I call you back at a better time.

1. Is your company a U.S. company or are you foreign owned?

- a. U.S. ☐
- b. Foreign ☐
- c. Other ☐
- 1. Specify _____

2. How many years of EDI experience does your company have?

- a. 1 year ☐
- b. 2 years ☐
- c. 3 years ☐
- d. 4 years ☐
- e. 5+ years ☐

3. What EDI document standards or formats are you currently using?

- a. ANSI X12 ☐
Subsets
1. VICS ☐
2. EDX ☐
3. EIDX ☐
4. CIDX ☐
5. AIAG ☐
6. Other subsets ☐
 a. Specify _____
 b. Specify _____
- b. UCS (grocery) ☐
c. TDCC ☐
d. WINS ☐
e. NITL ☐
f. Spec2000 ☐
g. EDIFACT ☐
h. ABI/Customs ☐
i. Other formats ☐
(K-mart, etc.)
 1. Specify _____
 2. Specify _____

4a. Would you describe yourself, or your company as ACTIVE or INACTIVE in developing and maintaining EDI standards on an industry wide basis?

1. Active ☐
2. Inactive ☐

4b. Why are you active or inactive in EDI standards work?

5a. Is your company now involved in INTERNATIONAL TRADE?

1. Yes ☐
2. No ☐

5b. (IF YES), Approximately how many international trading partners do you have?

- 1. 1-5 ☐
- 2. 6-10 ☐
- 3. 11-20 ☐
- 4. 21-50 ☐
- 5. 51+ ☐
- 6. No response/
Don't know ☐

5c. Of these, how many do you trade with using EDI?

- 1. 0 ☐
- 2. 1-5 ☐
- 3. 6-10 ☐
- 4. 11-20 ☐
- 5. 21+ ☐
- 6. No response/
Don't know ☐

5d. Which of the following regions of the world do you trade with?

- 1. Canada ☐
- 2. Western Europe ☐
- 3. Eastern Europe ☐
- 4. Asia (Far East and Japan) ☐
- 5. Middle East ☐
- 6. Australia/New Zealand ☐
- 7. South and Central America ☐
- 8. Africa ☐
- 9. No response/Don't know ☐

5e. (IF NO), Do you think your company will become involved in international trade in the next 3-5 years?

- 1. Yes ☐
- 2. No ☐
- 3. Other Answer: _____

6. Where do you get most of your information about EDIFACT? Can you identify the sources of information? Is it:

- a. A Training Course or Seminar ☐
- b. A Network Service Company ☐
- c. An EDI Software House ☐
- d. EDI Newsletters ☐
- e. Trade Publications ☐
- f. EDI Associations such as ANSI X12 ☐
- g. Your own Industry Association ☐ Which one _____
- h. Your associates at other companies ☐
- i. A Government Agency ☐ Which one _____
- j. Other ☐
 - 1. Specify _____
 - 2. Specify _____
- k. No response/Don't know ☐

7. Who do you think **should** be providing information about EDIFACT? You can answer with as many as you like:

- a. A Training Course or Seminar ☐
- b. Network Service Companies ☐
- c. EDI Software Houses ☐
- d. Newsletters ☐
- e. Trade Publications ☐
- f. EDI Associations such as ANSI X12 ☐
- g. Your own Industry Association ☐
- h. Your associates at other companies ☐
- i. A Government Agency ☐
- j. Other ☐
 - 1. Specify _____
 - 2. Specify _____
- k. No response/Don't know ☐

8a. On a scale of 1-5, with "1" being low and "5" being high, how would you rate your **interest** in the EDIFACT Standard?

Low High
 1 2 3 4 5

8b. On the same scale of 1-5, how would you rate your **understanding** of the EDIFACT Standard?

1 2 3 4 5

8c. On the same scale of 1-5, how would you rate the **importance** of having a single, global standard for EDI?

1 2 3 4 5

9a. On the same scale of 1-5, how effectively do you feel **your interests** are being represented by those developing the EDIFACT formats?

Low High

1. 1 2 3 4 5

2. No response/Don't know ☐

9b. On the same scale of 1-5, how effective do you think are **current procedures** for developing worldwide standards for EDI?

1. 1 2 3 4 5

2. No response/Don't know ☐

9c. How could **your interests** be better represented with regards to EDIFACT development?

1. _____

2. No response/Don't know ☐

9d. How could **procedures** be changed to be more effective?

1. _____

2. No response/Don't know ☐

10. Can you identify the **sponsor** of the EDIFACT standard?

- a. Multinational corporations ☐
- b. U.S. State Department ☐
- c. ANSI X12 ☐
- d. European Economic Commission ☐
- e. European Common Market ☐
- f. U.S. Department of Transportation ☐

- g. United Nations ☐
- h. U.S. Customs Agency ☐
- i. Other ☐
 - 1. Specify _____
 - 2. Specify _____
- j. No response/Don't know ☐

11. On a scale of 1-5, with "1" being low and "5" being high, how would you rate your company's sense of urgency with regards to implementing EDIFACT for your company... in other words, how much of a priority is EDIFACT to YOUR company:

Low High

a. 1 2 3 4 5

b. No response/Don't know ☐

c. Why this response? _____

- 12a. On a realistic basis, when do you expect EDIFACT will be ready to meet your company's needs?

- 1. 1 year or less ☐
- 2. 2 years ☐
- 3. 3 years ☐
- 4. 4 years ☐
- 5. 5+ years ☐
- 6. Never ☐
- 7. No response/
Don't know ☐

12b. Why do you estimate this time frame? _____

13. Approximately how many EDIFACT transactions do you think are now available, at least for trial use?

- a. 0 ☐
- b. 1 ☐
- c. 2-3 ☐
- d. 4-5 ☐
- e. 6-10 ☐
- f. 11+ ☐
- g. No response/
Don't know ☐

14. What is your opinion of the following issues. On a scale of 1 to 5, with "1" being little or no concern and "5" being a very great concern, how concerned are you about the following?

	<u>Not Concerned</u>			<u>Very Concerned</u>		<u>No Response/ Don't Know</u>
a. The cost of using EDIFACT operationally	1	2	3	4	5	6
b. The cost of implementing an EDIFACT System	1	2	3	4	5	6
c. Maintaining and updating software for use with EDIFACT	1	2	3	4	5	6
d. The ability of the networks to handle EDIFACT transactions	1	2	3	4	5	6
e. The possible need to have two systems: one for ANSI or another standard, and one for EDIFACT	1	2	3	4	5	6
f. Do you have any other concerns? <input type="checkbox"/>						
1. Specify_____	1	2	3	4	5	6
2. Specify_____	1	2	3	4	5	6

(Note- "6" is for No response/Don't know)

15. What is your opinion of the following impediments to the use of EDIFACT formats for EDI? On a scale of 1 to 5, with "1" being strongly disagree and "5" being strongly agree, how would you rate the following?

	<u>Disagree</u>					<u>Agree</u>	<u>No Response/ Don't Know</u>
a. EDI standards like ANSI are already used	1	2	3	4	5		6
b. People don't understand EDIFACT technically	1	2	3	4	5		6
c. People don't see the need for EDIFACT	1	2	3	4	5		6
d. There aren't enough documents covered by EDIFACT	1	2	3	4	5		6
e. There's little or no software for EDIFACT	1	2	3	4	5		6
f. EDIFACT is a European invention—it was not invented here	1	2	3	4	5		6
g. Are there any other impediments that you can think of?____							
1. Specify_____	1	2	3	4	5		
2. Specify_____	1	2	3	4	5		

(Note- "6" is for No response/Don't know)

- 16a. Given that there are different standards in various industries and in various regions of the world, do you think the problems can be resolved?

1. Yes ☐
2. No ☐
3. No response/
Don't know ☐

- 16b. Why this response? _____
- _____
- _____
- _____
- _____

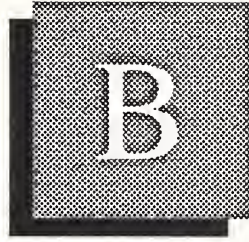
17. One final question. What kind of help do you think you, and other EDI managers are going to need to understand and implement EDIFACT in the future, and who do you think should be providing this help?

a. What help is needed? _____

b. Who should provide this help? _____

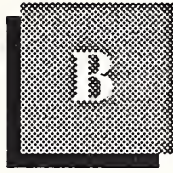
c. No response/Don't know ☐

That completes the interview. Thank you very much for your help.



Questionnaire: EDIFACT User—North America/Europe





Questionnaire: EDIFACT User (North America/Europe)

Hello. My name is _____. I'm calling from INPUT, the EDI research company in California.

We're doing a special study on EDIFACT for the EDI Association in Washington. It's a very important project and we'd like your help on it because we know you're one of the pioneers using EDIFACT at your company.

I have just a few short questions.... it won't take more than 10 minutes. Is now a good time, or should I call you back at a better time.

1. What EDI document standards or formats are you currently using, IN ADDITION to EDIFACT?

- a. ANSI X12 ☐
 - Subsets
 - 1. VICS ☐
 - 2. EDX ☐
 - 3. EIDX ☐
 - 4. CIDX ☐
 - 5. AIAG ☐
 - 6. Other subsets ☐
 - a. Specify _____
 - b. Specify _____
- b. UCS (grocery) ☐
- c. TDCC ☐
- d. WINS ☐
- e. NITL ☐
- f. Spec2000 ☐
- g. EDIFACT ☐
- h. ABI/Customs ☐
- i. Other formats ☐
 - (K-mart, etc.)
 - 1. Specify _____
 - 2. Specify _____

2a. Since you are an EDIFACT user, I assume that your company is involved in INTERNATIONAL TRADE. Is that correct?

1. Yes ☐
2. No ☐

2b. (IF YES), Which of the following regions of the world do you trade with?

1. Canada ☐
2. Western Europe ☐
3. Eastern Europe ☐
4. Asia (Far East and Japan) ☐
5. Middle East ☐
6. Australia/New Zealand ☐
7. South and Central America ☐
8. Africa ☐
9. No response/Don't know ☐

2c. With which of the following regions are you using EDIFACT?

1. Canada ☐
2. Western Europe ☐
3. Eastern Europe ☐
4. Asia (Far East and Japan) ☐
5. Middle East ☐
6. Australia/New Zealand ☐
7. South and Central America ☐
8. Africa ☐
9. No response/Don't know ☐

3. Why did you start using EDIFACT?

- a. Competitive reasons ☐
- b. Trading partners request ☐
- c. Other reasons ☐
 1. Specify _____
 2. Specify _____

4. On a scale of 1-5, with "1" being low and "5" being high, how would you rate your understanding of the differences between EDIFACT and ANSI X12?

<u>Low</u>				<u>High</u>
1	2	3	4	5

5a. On the same scale of 1-5, how effectively do you feel your interests are being properly represented by those developing the EDIFACT formats?

1	2	3	4	5
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5b. How could **your interests** be better represented with regards to EDIFACT development?

6. Where do you get most of your information about EDIFACT? Can you identify the sources of information? Is it:

- a. A Training Course or Seminar ☐
- b. A Network Service Company ☐
- c. An EDI Software House ☐
- d. EDI Newsletters ☐
- e. Trade Publications ☐
- f. EDI Associations such as ANSI X12 ☐
- g. Your own Industry Association ☐ Which one _____
- h. Your associates at other companies ☐
- i. A Government Agency ☐ Which one _____
- j. Other ☐
 - 1. Specify _____
 - 2. Specify _____

7. Who do you think should be providing information about EDIFACT? You can answer with as many as you like:

- a. A Training Course or Seminar ☐
- b. A Network Service Company ☐
- c. An EDI Software House ☐
- d. EDI Newsletters ☐
- e. Trade Publications ☐
- f. EDI Associations such as ANSI X12 ☐
- g. Your own Industry Association ☐ Which one _____
- h. Your associates at other companies ☐
- i. A Government Agency ☐ Which one _____
- j. Other ☐
 - 1. Specify _____
 - 2. Specify _____

8. On a scale of 1-5, with "1" being low and "5" being high, how would you rate your company's **sense of urgency** with regards to implementing EDIFACT for your company... in other words, how much of a priority is EDIFACT to YOUR company:

a. Low High
 1 2 3 4 5

b. No response/Don't know ☐

c. Why this response? _____

9. What is your opinion of the following issues. On a scale of 1 to 5, with "1" being little or no concern and "5" being a very great concern, how concerned are you about the following?

	<u>Not Concerned</u>				<u>Very Concerned</u>	<u>No Response/ Don't Know</u>
a. The cost of using EDIFACT operationally	1	2	3	4	5	6
b. The cost of implementing an EDIFACT System	1	2	3	4	5	6
c. Maintaining and updating software for use with EDIFACT	1	2	3	4	5	6
d. The ability of the networks to handle EDIFACT transactions	1	2	3	4	5	6
e. The possible need to have two systems: one for ANSI or another standard, and one for EDIFACT	1	2	3	4	5	6
f. Do you have any other concerns? <input type="checkbox"/>						
1. Specify _____	1	2	3	4	5	6
2. Specify _____	1	2	3	4	5	6

(Note- "6" is for No response/Don't know)

10. What is your opinion of the following **impediments** to the use of EDIFACT formats for EDI? On a scale of 1 to 5, with "1" being strongly disagree and "5" being strongly agree, how would you rate the following?

	<u>Disagree</u>			<u>Agree</u>		<u>No Response/ Don't Know/</u>
a. EDI standards like ANSI are already used	1	2	3	4	5	6
b. People don't understand EDIFACT technically	1	2	3	4	5	6
c. People don't see the need for EDIFACT	1	2	3	4	5	6
d. There aren't enough documents covered by EDIFACT	1	2	3	4	5	6
e. There's little or no software for EDIFACT	1	2	3	4	5	6
f. EDIFACT is a European invention—it was not invented here	1	2	3	4	5	6
g. Are there any other impediments that you can think of?____						
1. Specify_____	1	2	3	4	5	
2. Specify_____	1	2	3	4	5	

(Note- "6" is for No response/Don't know)

11. Did you have any problems when you implemented EDIFACT, and if so, how did you resolve them?

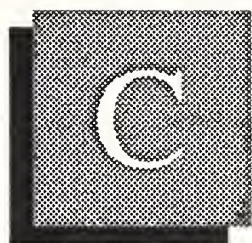
12. One final question. What kind of help do you think you and other EDI managers are going to need to understand and implement EDIFACT in the future, and who do you think should be providing this help

- a. What help is needed? _____

- b. Who should provide this help? _____

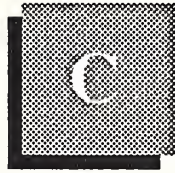
- c. No response/Don't know ☐

That completes the interview. Thank you very much for your help.



Questionnaire: Government Agency—North America/ Europe/Pacific Rim





Questionnaire: Government Agency (North America/Europe/Pacific Rim)

Hello. My name is _____. I'm calling from INPUT, the EDI research company in California.

We're doing a special study on EDIFACT for the EDI Association in Washington. It's a very important project and we'd like your help on it. We want to accurately report government policies as they relate to EDI standards and formats.

I have just a few short questions.... it won't take more than 10 minutes. Is now a good time, or should I call you back at a better time.

1. First of all, how would you briefly describe your agency's role in using or promoting EDI?

- 2a. Would you describe your agency as **ACTIVE** or **INACTIVE** in developing and maintaining **government** EDI standards?

1. Active ☐
2. Inactive ☐

- 2b. Why are you active or inactive in government standards work?

3a. Would you describe your agency as **ACTIVE** or **INACTIVE** in developing and maintaining **commercial EDI** standards?

- 1. Active ☐
- 2. Inactive ☐

3b. Why are you active or inactive in commercial standards work?

4. Can you categorize your agency's official or unofficial stance regarding the use of specific EDI standards or formats within your areas of interest?

5. On a scale of 1-5, with "1" being low and "5" being high, how would you rate your **interest** in the EDIFACT Standard?

1 2 3 4 5

6. On a scale of 1-5, with "1" being low and "5" being high, how would you rate your **understanding** of the EDIFACT Standard?

1 2 3 4 5

7a. On the same scale of 1-5, how effectively do you feel **your agency's interests** are being **represented** by those developing the EDIFACT formats?

1 2 3 4 5

7b. Why this response? _____

8. How could **your agency's interests** be better represented with regards to EDIFACT development?

9. Where do you get most of your information about EDIFACT? Can you identify the sources of information? Is it:

- | | | |
|--------------------------------------|--------------------------|----------------|
| a. A Training Course or Seminar | <input type="checkbox"/> | |
| b. A Network Service Company | <input type="checkbox"/> | |
| c. An EDI Software House | <input type="checkbox"/> | |
| d. EDI Newsletters | <input type="checkbox"/> | |
| e. Magazines | <input type="checkbox"/> | |
| f. EDI Associations such as ANSI X12 | <input type="checkbox"/> | |
| g. Your own Industry Association | <input type="checkbox"/> | Which one_____ |
| h. Your associates at other agencies | <input type="checkbox"/> | |
| i. Another Government Agency | <input type="checkbox"/> | Which one_____ |
| j. Other | <input type="checkbox"/> | |
| 1. Specify_____ | | |
| 2. Specify_____ | | |

10. Who do you think **should** be providing information about EDIFACT? You can answer with as many as you like:

- | | | |
|--------------------------------------|--------------------------|----------------|
| a. A Training Course or Seminar | <input type="checkbox"/> | |
| b. A Network Service Company | <input type="checkbox"/> | |
| c. An EDI Software House | <input type="checkbox"/> | |
| d. Newsletters | <input type="checkbox"/> | |
| e. Magazines | <input type="checkbox"/> | |
| f. EDI Associations such as ANSI X12 | <input type="checkbox"/> | |
| g. Your own Industry Association | <input type="checkbox"/> | Which one_____ |
| h. Your associates at other agencies | <input type="checkbox"/> | |
| i. Another Government Agency | <input type="checkbox"/> | Which one_____ |
| j. Other | <input type="checkbox"/> | |
| 1. Specify_____ | | |
| 2. Specify_____ | | |

11. On the same scale of 1-5, with "1" being low and "5" being high, how would you rate your agency's **sense of urgency** with regards to implementing EDIFACT in the government... in other words, how much of a priority is EDIFACT to YOUR agency:

a. 1 2 3 4 5

b. Why this response _____

12a. On a realistic basis, when do you expect EDIFACT will be ready to meet your agency's needs?

- | | |
|-------------------|--------------------------|
| 1. 1 year or less | <input type="checkbox"/> |
| 2. 2 years | <input type="checkbox"/> |
| 3. 3 years | <input type="checkbox"/> |
| 4. 4 years | <input type="checkbox"/> |
| 5. 5+ years | <input type="checkbox"/> |
| 6. Never | <input type="checkbox"/> |

12b. Why do you estimate this time frame? _____

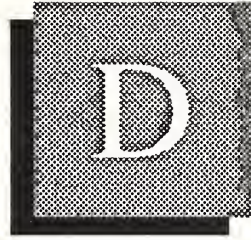
13. Our final question. What kind of help do you think you, and other EDI managers in the government, are going to need to understand and implement EDIFACT in the future, and who do you think should be providing this help?

a. What help is needed? _____

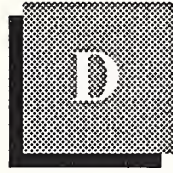
b. Who should provide this help? _____

c. No response/Don't know ☐

That completes the interview. Thank you very much for your help.



Questionnaire: Vendor— North America/Europe/ Pacific Rim



Questionnaire: Vendor (North America/Europe/Pacific Rim)

Hello. My name is _____. I'm calling from INPUT, the EDI research company in California.

We're doing a special study on EDIFACT for the EDI Association in Washington. It's a very important project and we'd like your help on it. We're questioning users and vendors on a variety of issues. The results of our survey will be published by the EDI Association, and presented at the December conference in Washington. We will provide a summary of the findings to the respondents of this survey.

I have just a few short questions.... it won't take more than 10 minutes. Is now a good time, or should I call you back at a better time.

NETWORK Questions

1. Is your network now involved in INTERNATIONAL EDI?
 - a. Yes ☐
 - b. No ☐
2. (IF YES), Can you estimate the volume of international traffic your network carries by percentage for each of the following regions. The total should be close to 100%.
 - a. _____ North America
 - b. _____ Asia (Japan, Pacific Rim, Mainland Asia)
 - c. _____ Australia/New Zealand
 - d. _____ Western Europe
 - e. _____ Eastern Europe
 - f. _____ South and Central America
 - g. _____ The Middle East
 - h. _____ Africa
 - 100%
 - i. No response/Don't know ☐

3. Does your network support the EDIFACT Format?

- a. Yes ☐
b. No ☐

4. Do you offer ON-NETWORK Translation between any format and EDIFACT?

- a. Yes ☐
b. No ☐

5a. IF YES: Which formats can you translate to and from EDIFACT?

U.S. Formats

1. ANSI X12 ☐

Subsets

- a. VICS ☐
b. EDX ☐
c. EIDX ☐
d. CIDX ☐
e. AIAG ☐
f. Other subsets ☐

1. Specify _____

2. Specify _____

2. UCS (grocery) ☐

3. TDCC ☐

4. WINS ☐

5. NITL ☐

6. Spec2000 ☐

7. ABI/Customs ☐

8. Other formats ☐

(K-mart, etc.)

1. Specify _____

2. Specify _____

European Formats

9. TDI/Tradcoms ☐

10. ODETTE ☐

11. Other formats ☐

a. Specify _____

b. Specify _____

5b. (If offer on-network EDIFACT translation), What are the charges for EDIFACT translation?

6a. Is there a set-up charge for EDIFACT translation?

1. Yes ☐
2. No ☐

6b. (IF YES), How much is it?

7. Can you estimate the number of USERS who are using YOUR NETWORK for EDIFACT-standard transactions?

SOFTWARE Questions

1. Is your software being sold overseas?
 - a. Yes ☐
 - b. No ☐

2. (IF YES), Can you estimate the percent of your software, by number of packages installed, for each region I mention. The total should be close to 100% for your international sales only.
 - a. _____ North America
 - b. _____ Asia (Japan, Pacific Rim, Mainland Asia)
 - c. _____ Australia/New Zealand
 - d. _____ Western Europe
 - e. _____ Eastern Europe
 - f. _____ South and Central America
 - g. _____ The Middle East
 - h. _____ Africa
 - 100%
 - i. No response/Don't know ☐

3. Does your software support the EDIFACT Format?
 - a. Yes ☐
 - b. No ☐

4. Can your software translate BETWEEN EDI Formats?
 - a. Yes ☐
 - b. No ☐

5. (IF YES), Which formats can your software translate to/from EDIFACT?

U.S. Formatsa. ANSI X12 ☐

Subsets

1. VICS ☐2. EDX ☐3. EIDX ☐4. CIDX ☐5. AIAG ☐6. Other subsets ☐

a. Specify _____

b. Specify _____

b. UCS (grocery) ☐c. TDCC ☐d. WINS ☐e. NITL ☐f. Spec2000 ☐g. ABI/Customs ☐h. Other formats ☐

(K-mart, etc.)

1. Specify _____

2. Specify _____

European Formatsi. TDI/Tradcoms ☐j. ODETTE ☐k. Other formats ☐

a. Specify _____

b. Specify _____

6. Can you estimate the number of USERS who are using YOUR software for EDIFACT-standard transactions?

7. What is the cost of an additional EDIFACT module?

ALL COMPANIES

- A. How would you describe your company's official position regarding support for EDIFACT?

- B. Would you describe your company as ACTIVE or INACTIVE in developing and maintaining EDI standards on an industry wide basis?

1. Active ☐
2. Inactive ☐

- C. Why are you active or inactive in standards work?

- D. On a scale of 1-5, with "1" being low and "5" being high, how would you rate your current customer's interest in the EDIFACT Standard?

1 2 3 4 5

- E. On a scale of 1-5, with "1" being low and "5" being high, how would you rate your current customer's understanding of the EDIFACT Standard?

1 2 3 4 5

- F. On the same scale of 1 to 5, how would you rate your current customer's understanding of the differences between EDIFACT and ANSI X12?

1 2 3 4 5

- G. On the same scale of 1-5, how would you rate your customers interests being properly represented by those developing the EDIFACT formats?

1 2 3 4 5

- H. Why this response?

- I. How could your customers interests be better represented with regards to EDIFACT development?

- J. How about your interests. On the same scale of 1-5, how well are you being represented by those developing the EDIFACT standards?

1 2 3 4 5

- K. Why this response?

L. How could your interests be better represented with regards to EDIFACT development?

M. On the same scale of 1-5, how would you rate your customer's sense of urgency with regards to implementing EDIFACT? In other words, how much of a priority is EDIFACT to YOUR customers?

1 2 3 4 5

N. On a realistic basis, when do you expect EDIFACT will be ready to meet your customer's needs?

- | | |
|-------------------------------|--------------------------|
| 1. 1 year or less | <input type="checkbox"/> |
| 2. 2 years | <input type="checkbox"/> |
| 3. 3 years | <input type="checkbox"/> |
| 4. 4 years | <input type="checkbox"/> |
| 5. 5+ years | <input type="checkbox"/> |
| 6. Never | <input type="checkbox"/> |
| 7. No response/
Don't know | <input type="checkbox"/> |

O. Why do you estimate this time frame?

Thank you for your help so far. I have just a few more questions and we'll be done.

- P. On a scale of 1-5, with "1" being low and "5" being high, how would you rate the following issues or concerns users may have about EDIFACT. (This is your estimate of how concerned users are about the following issues.)

	<u>Not Concerned</u>				<u>Very Concerned</u>	<u>No Response/ Don't Know</u>
1. The cost of using EDIFACT operationally	1	2	3	4	5	6
2. The cost of implementing an EDIFACT System	1	2	3	4	5	6
3. Maintaining and updating software for use with EDIFACT	1	2	3	4	5	6
4. The ability of the networks to handle EDIFACT transactions	1	2	3	4	5	6
5. The possible need to have two systems: one for ANSI or another standard, and one for EDIFACT	1	2	3	4	5	6
f. Do you have any other concerns? <input type="checkbox"/>						
1. Specify_____	1	2	3	4	5	6
2. Specify_____	1	2	3	4	5	6

(Note- "6" is for No response/Don't know)

- Q. Do you have any comments on these concerns we've just discussed?

R. Our final question. What kind of help do you think EDI managers are going to need to understand and implement EDIFACT in the future, and who do you think should be providing this help?

1. What help is needed? _____

2. Who should provide this help? _____

3. No response/Don't know ☐

That completes the interview. Thank you very much for your help.

